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ABSTRACT

The paradigm upon which this report rests is the cause and effect relationships resulting from the explosion of knowledge and technology in the twentieth century. The first section of the report explores change and technology and their impact on present and future roles for classroom teachers. The second section provides descriptions of current exemplary programs in preservice and inservice teacher education from which a framework can be developed for alternative possibilities in the future. Since these programs are centered around the present and future needs of schools, teachers, and children, the possibilities of new role needs are inherently included. The program summaries are divided into five categories: (1) developmental; (2) behavioral; (3) humanistic; (4) behavioral/humanistic; and (5) other approaches. A glossary of relevant terms is included. (PG)

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# INNOVATION IN TEACHER EDUCATION: THE CHALLENGE TO PREPARE TEACHERS AS AGENTS OF CHANGE

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## FORWARD

The research upon which this report is based has been extensive and thorough, utilizing an analysis of 1282 ERIC documents, 872 dissertation abstracts, numerous articles from professional journals, and several books concerned with concepts of change, creativity, and social self-renewal. The research per se has been a dynamic and self-renewing process through which the author has reaffirmed former commitments to the dynamic impact of education upon society and has gained new insights into the critical role of both teacher education and the teacher as a major instrument in social-cultural renewal and preservation.

Buffalo, New York
January 1980

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## INTRODUCTION

The purpose of this report is to assist organizations, institutions, and individuals which are part of the educational system in developing new insight and awareness into the impact of change and technology upon education. To achieve this purpose, the report is divided into three major sections. The first section deals with a discussion of change and technology and its impact upon present and future roles for classroom teachers. The second section provides descriptions of exemplary programs in preservice and inservce teacher education from which the reader can develop a framework for alternative possiblities for the future of similar programs. Since these exemplary programs are centered around the present and future needs of schools, teachers, and children, further possiblities for new role-needs are inherently included. The final section of the report summarizes the need for change, the roles for which future teachers must be prepared, and provides a theoretical model supportive of a new rationale for program priorities and an outline of the steps necessary to implement change and retain self-renewing innovation.

The paradigm upon which this report rests is based upon the cause-effect relationships arising out of the explosion of knowledge and technology unique to the twentieth century. The rapidity of change generated from the massive and complex additions to bodies of knowledge in all fields combined with the instant and pulsating effects of electronic technology on a society geared to slower, more sequential processes demand that education reexamine itself in terms of purpose, process, and results.

The one certainty in the midst of this rapid change is that the future of society is indeed uncertain. Teachers are forced into new roles of openness, flexibility, self-motivation, lifelong learning and must themselves become agents of change, shaping the institution in reaction to new and powerful outside influences. In addition, mass education and mass media are producing an informed consumer who is demanding that education and teachers be held accountable for the results of their efforts in terms of teacher effectiveness and cost of services.

Technology and research are not only forces which require change, they are also providing the vehicle for many of the changes which must be made. Systems

analysis, educational technology, electronic communications systems, and the results of research in behavioral and social sciences provide many of the tools for analysis, design, implementation, and effectiveness of results.

To meet the demand for new types of teaching competencies, teacher edcuation programs are utilizing partnerships for development and utilization of resources and realistic clinical settings for preservice experience. Recognizing the need for continual learning on the part of the classroom teacher, the centers which evolve from the partnerships provide a continuum for ongoing inservice education. Research and development arising out of the centers is feeding back into the knowledge/technology explosion. The process is cyclical, dynamic, and self-renewing. (See Figure 1.)

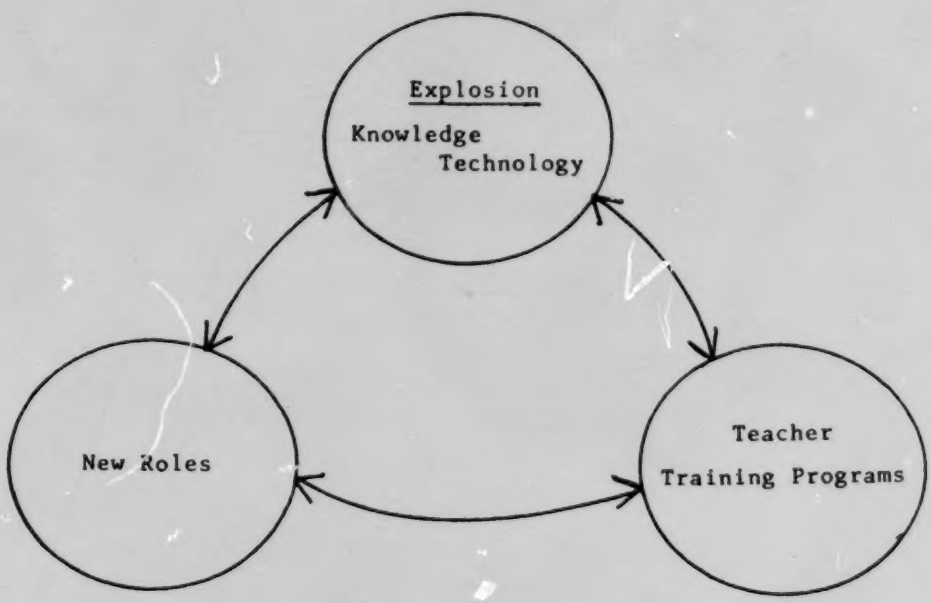



Figure 1

A DYNAMIC, SELF-RENEWING PROCESS: DEMAND, CHANGE, FEEDBACK

# CHAPTER ONE

## The Impact of Change and Technology: New Roles for Teachers

> We live in an extradordinary age. These are times of stunning changes in social organization, economic well-being, moral and ethical precepts, philosophical and religious perspectives, and human self-knowledge . . . (Carl Sagan, 1979).

CHANGE AND EDUCATION

While there is no simple cause and effect explanation for the tremendous changes occurring in society, technological and scientific advancement and the massive increases in accumulated bodies of knowledge from all fields are vital factors. (See Figure 1.) Schools are finding that organization, curriculum, techniques, and goals are constantly changing and new ones evolving. Education, indeed, is influenced directly by technological and social forces and by the impact of the emerging behavioral sciences (Flynn, 1970).

Technology plays a dual role in the new educational change. It is both the cause of, and the vehicle for, innovation which involves staff organization, architecture, curriculum revision, and scheduling. Commercialization is also closely related to educational change as seen in industry competing in the school market with supplies, textbooks, teaching materials, teaching machines, new curricula, and a variety of supplementary materials and media.

All teachers are greatly affected by the many forces acting upon the schools today. Each change in curriculum and organization brings changes in roles for teachers. The lack of consensus about what the role of the teacher should be under any circumstances, compounds the problem of defining and clarifying the teacher's role. Also, the many diverse teaching styles and behaviors of teachers based upon personal factors add to the complexity of roles and the problem of definition. As a result of all factors, the teacher's role is diversified, changing, and difficult to define.

In reality, teacher characteristics vary and the "good" teacher fills a role of variable description: "There is no teacher who is good for all children. A teacher who is good in one system is not likely to be equally good in another system." (Lipson, 1970.) There is a need for such diversity of

personalities and abilities. If those who are presently teaching and those who will enter the profession at a later date are to do a good job, school systems must be created which are designed to take into account the realistic differences in teacher characteristics.

Teachers should be advanced on the career ladder on the basis of performance. To perform well, teachers need financial support for necessary materials, active participation in curriculum development, inservice participation, professional-level salaries, and professional treatment from administrators. In order to determine the nature of acceptable and competent performance, it is necessary to predict to the best possible degree what the role of the teacher will be.

## FORECASTING THE FUTURE

One process for forecasting the impact of future roles in education is "contextual mapping." (Rosove, 1970.) Contextual mapping is a graphical display showing logically and causally related hypotheses about social, cultural, and technolgoical phenomena, their interrelationships and interdependencies. (Figure 1 is an example of a contextual map.) While Rosove's specific contextual map is not available for sampling, a description of the components will provide some insight into the change process, the factors causing and facilitating such change, and the bases for Rosove's underlying philosophy that schooling and related problems must be approached from the context of "real time." The description may also serve the reader a base for developing a contextual map, adaptive to his or her unique social and cultural circumstances, which draws upon these and other factors not identified.

Rosove identified six major trends at the root of change: 1) Cultural--increasingly empirical, humanistic, pragmatic, utilitarian, and sensitive; 2) Socio-cultural--same descriptors as (1); 3) Economic--transitional, mass-consumption society characterized by higher gross national product and personal incomes, affluence among the better educated; 4) International Economic--world-wide industrialization and modernization; 5) Science and Technology (Organization)--institutionalization of change, especially through research, development, innovation, and organized diffusion; 6) Science and Technology (Information)--accumulation of scientific and technological knowledge. These six trends relate to and are interdependent with major sub-trends, social and technical implications, educational functions, future

roles in education, and major issues.

The future role of the teacher, as Rosove sees it, must be addressed to the real-time environment evolving out of the rapid changes and massive influences caused by the relationships and interdependencies of identified factors. When change is slow, institutions can function successfully in a nonreal time mode, as education presently tends to do when it addresses schooling with structures and methods appropriate to a slower nontechnological society. In the face of rapid change, however, institutions must function within the context of real time—the reality of today's society. Schools must get into the real-time mode in order to prepare individuals to function in that real world. Continuous life-long learning is a necessity if individuals are to cope with just the aspect of rapidity of occupational changes during their adult lives. This requires persons who are in touch with education, educational process, and self-directed to acquire new knowledge. It is, in essence, a "learning society" that learners must be prepared to enter as adults.

In order to take a real-time approach, schools must employ the advantages of educational technology. To use technology efficiently, the teacher must become a facilitator of knowledge as part of a man-machine learning system. This requires not only new technical skills on the part of the teacher, but massive changes in attitudes as well.

In subject-area fields, teachers must be specialized so that facts are not taught without the underlying conceptual frameworks. Technology can assist the teacher in that task and it can also bring reality into a classroom where students view contemporary events as they occur.

The social consequences of bringing the real-time mode into education are immense and only can be accomplished through cooperative efforts on the part of education and technology to clearly define educational objectives, then proceed to specify the system requirements for meeting those objectives. In essence, education must become part of the real world, reflecting and utilizing the technological support systems available. Teacher roles must consequently be part of that network of change and will fall into the area of facilitating learning through management of the available and specified technological-instructional systems.

ACCOUNTABILITY

Accountability is a powerful catalyst in achieving the basis for the reform and renewal needed in education (Lessinger, 1970). Demands for accountability are also part of the knowledge-technology impact upon society. Mass media and mass education have produced an informed population with a raised level of consciousness who are demanding results from professional educators in terms of the time and money spent for education.

To educators, accountability involves setting goals, evaluating whether or not they have been met, and accepting responsibility for the results. Accountability depends upon adequate evaluation designs so that causality can be determined, good measurement, and the correct use of the resulting data.

The concept of accountability as stated by Lessinger, has three major aspects: 1) student accomplishment, 2) independent review, 3) student accomplishment and a public report relating money spent to student accomplishment (results).

Accountability means and can accomplish: 1) a principal shift in the focus of education from teaching to learning; 2) a revised commitment on the part of education that every child shall learn and is able to learn and a placement of responsibility for failure on the system, not on the child; 3) better practices and better applications of educational technology—the use of tested means to secure demonstrated results; 4) accountability will become a reality only if sufficient development capital is provided; 5) there must be "modes of proof"; this is more than the results of standardized testing—it includes such evidence as tests, hearings, expert evaluation, auditors, reproduced work situations, i.e., videotapes, and statistically demonstrated student performance; 6) the development of a body of knowledge and related procedures (educational engineering) to produce personnel competent in initiating the change process—the adaptation of sound practice.

Changes that can be expected in schools as a result of the demand for accountability are: 1) the teaching role will change from information giving to learning direction and facilitation; 2) schools will be more open, more flexible, and less group-oriented; 3) the curriculum will become more relevant with a shift in emphasis from process to results; 4) a major change in attitude will occur from "can't" to "can" and a willingness to try alternate ways will develop.

TECHNOLOGY: CHANGE AND NEW ROLES

How does technology fit into and change the role of the teacher? The traditional role of the teacher at all levels has been essentially that of lecturer. This formal traditional activity does not meet the needs of many students for more personal and responsive communication (Fischler, 1970). There are some changes that can be implemented with the technology presently available for instructional purposes.

To effect change in the instructional program, teachers must begin by developing a set of behavioral objectives for their programs. Once these goals are written, an enabling learning environment can be designed.

In the new type of instructional system which will be developed, objectives are given to students at the beginning of a learning activity. Students also receive a guide to all the resources available to him or her to meet those objectives. The teacher is able to upgrade the course by observing those references and resources which are most used and most helpful to students. Information that students need for discussion groups also is specified in advance. This allows discussion interaction to occur at a higher level than if students are not prepared.

Modules are effective for individualizing instruction through different pacing, different cognitive levels, alternate experiences, etc., and also provide for the development of independent learners. This approach to instruction releases the teacher from the lecture routine and allows more time for small-group and individual discussion and counseling.

A differentiated staff to assist the teacher, i.e., media developers, discussion leaders, aides, etc., is also provided. As students become independent learners, the system can accomodate larger populations. The use of such educational technology as learning laboratories, tele-lectures, videotapes, etc., lend themselves to independent work.

Human beings characteristically resist change. When change is not sought, some type of confrontation is necessary to induce it. Student militancy is a crisis form of confrontation, but the introduction of educational technology is another more stable form of confrontation which can become a catalyst to force reexamination of present conditions and to provide encouragement for subsequent change.

In a traditional classroom, the teacher not only presents most information and administers most tests, but is also dependent upon personal resources to answer many questions. In this role, the teacher must have artistry, sensitivity, and resourcefulness and decisions are largely based upon intuition (Kooi & Geddes, 1970).

Developers of such instructional technology as computer-assisted instruction are changing this role and making the teacher an instructional manager. As an instructional manager, the teacher must make multiple decisions instead of gross judgments, draw upon other teachers' and students' strengths, and provide lessons through a variety of media instead of a single presentation. The teacher must study each student's record and diagnose and prescribe individually to improve student performance. The latter also requires specialization and differentiation of roles so that each teacher's talents and skills can be utilized to their fullest extent.

An exemplary management system which supports the teacher's role as an instructional manager is called Instructional Management System (IMS). It is a computer-assisted system containing several components: course description, frequent tasks, computer-produced reports, and remedial prescriptions. The course description contains specific learning objectives that fall by content or skill into clusters of general objectives. Specific objectives tend to enter instruction and testing, then be dropped, while general objectives appear in instruction and testing for longer periods of time.

The evaluation of student performance is based upon frequent tests—formative evaluation—in which each item is tied to a specific objective. Tests are teacher-constructed with some technical assistance and are given when an initial unit of instruction is completed—summative evaluation. Test results provide the basis for remediation, then the instructional sequence is repeated with a new unit.

Such technologically-assisted instruction gives teachers the diagnostic/prescriptive support needed in new roles for individualized instruction.

It should be clear that instructional technology is an important factor affecting the teacher's new role. Although its full impact is not yet seen, certain factors within technology provide indicators of such roles. First, technology provides more of the information giving and correcting functions

normally performed by the teacher. This affects the allocation of teacher time during the day and allows the teacher to put time into such other functions as group discussion, social modeling techniques, counseling, and guidance. Second, as the teaching profession develops control over technology, teachers become more proficient in the understanding and the use of the systems involved. New teaching competencies thus center around technology which affects both pre- and inservice teacher education. Third, such highly developed technical competencies require greater differentiation of professional roles and a greater use of the team approach in organizational structure.

Systematic investigation of these new roles exists. Field study (Hansen & Harvey, 1970) supports and further indicates that: 1) Teachers perform less informational presentation functions and more managerial and strategy functions in sequencing and evaluating instruction; 2) Teachers are less involved in correcting and questioning and more involved with such important tasks as assessing individual student characteristics that are important to the design of instructional strategies; 3) The array of instructional resources and the decision-making necessary in using them are more complex and more frequent; 4) Teachers perform a wider range of discussion techniques and teachers have greater impact on the affective development of students; 5) Differentiation of staff does occur; 6) Teachers assume many of the diagnostic and prescriptive functions traditionally performed by psychologists and use more group interaction to foster social and creative development; 7) In teacher training programs, a closer relationship between university and school is required which promotes basic research and development on the use of technology for the purpose of continued feedback relative to new implications for teaching.

INDIVIDUALIZATION: NEW ROLES

The development of new media and new modes of instruction offers unique possibilities for adaptation to individual differences. Since today's learner has more content to learn and more options for alternative areas of instruction, classroom interaction must become more efficient, and each student's activities must be based upon his or her unique needs and interests.

Also, as previously stated, each student's experiences must prepare him or her to become a lifelong learner which requires self-direction, self-motivation, and a working knowledge of how to study and how to learn.

In view of these needs, "individualized instructional systems must prepare persons who seek opportunities to learn; who have capabilities for setting their own goals, planning an instructional program, and evaluating and monitoring their own learning progress." (Lindvall & Bolvin, 1970.) Thus, the teacher's role and all other aspects of instruction must be designed to enable this kind of instructional setting.

Externally controlled systems of individualized instruction, such as computer-assisted instruction, are efficient but do not provide learners with the internal-control development necessary to meet the goals stated above. Instead, individualized instruction must allow for active student involvement and participation in all aspects of the learning situation.

The teacher must be assisted by a support system which allows the desired type of individualization to occur. Individually Prescribed Instruction (IPI), as an exemplary system, is but a means to a goal and only one factor in the achievement of the goal of self-directed learning. The teacher's role in such instruction involves operation of the system, supplementation of the system to enhance adaptation to individual needs, and provision for goal achievement through teacher intervention. The teacher's role also extends into development and evaluation of the system. In other words, a technological system for individualization is not sufficient in and of itself to achieve the desired goals of personalized individualization.

A basic aspect of the teacher's role is to make the system function. This includes: 1) evaluation and diagnosis of the needs and progress of each student; 2) development of individual study plans or prescriptions; 3) development of immediate and long-range plans for the total class which takes individual needs into account; 4) planning and organization of the classroom and the class period to create an effective learning environment; 5) development, in cooperation with other staff members, of plans necessary for large-group instruction; 6) supervision of the work of paraprofessionals; 7) study and evaluation of the system so as to improve its operation in the classroom. In order to implement a technologically-based system, the teacher must make the basic mechanics of the system work and interface with the human aspects of the system.

Supplementing such a system is a necessary teacher task. This is true through certain aspects of evaluation, diagnosis, prescription, and instruction if the system is truly adapted to individual needs. An example of such intervention is the assessment of learner characteristics upon which alternate instructional activities must be based.

Another essential role the teacher faces is taking exceptions to the system when evidence deems this to be necessary. Decisions here might be made relative to raising or lowering the mastery level, omitting certain units, etc.

Providing for the achievement of personal goals is only possible with teacher attention on a personal basis. If students are to develop the capacity to set goals and carry out enabling self-directed study, there must be a number of experiences which require teacher-student involvement. An extension of this role is the counseling aspect where the teacher helps the student set realistic goals. This may involve a discussion at the first level, assistance with self-developed learning prescriptions at the next level, and assistance in mapping the unit activity path at a higher level.

The teacher must also develop a desirable learning environment through selective reinforcement of desirable pupil outcomes. This affects both student attitudes and student abilities with respect to carrying out learning tasks. Behavior modification systems are one tool that may be utilized here.

An important teacher role that is part of any learning system, particularly a technology-based system, is the teacher's role as motivator of learning. We know that all children can and do learn. " . . .the issue is whether or not we can teach children what we want them to learn." (Frieder, 1970.) The teacher's role as motivator has significant impact on the results of learning. This role has received little structured attention to date. However, we do know that motivation, as an integral part of the learning system requires clear statements of the desired results of learning if it is to yield significant results. In order to do this, decision making must occur: 1) what do we want children to learn? 2) which ones already know it? 3) how can it best be taught?

One organized model for developing a classroom learning environment that

enables sound decision making is called PRIME. The acronym PRIME is derived from the first letters of prescription, instruction, motivation, and evaluation (reported by Homme & Tosti, 1970). A further breakdown of the prescription factor includes objectives formulation, diagnosis, and prescription. The new acronym becomes OD PRIME which stands for the first letters of formulation of objectives, diagnosis of learner needs, prescription of instructional activities, instruction, motivation, and evaluation of achievement.

OD PRIME is a total system in which each component depends and interrelates with the other components. Research on individual components results in the eventual reintegration of the knowledge generated back into the system. Each time such integration occurs, the result is a new or restructured teacher role.

While some research on motivation has occurred, education has done little to integrate it back into the system. Because the teacher's role as motivator is so closely related to other system components, it is necessary to look at each component in order to analyze the needs required by the motivator's role.

In objectives formulation, teachers have generalized lists of objectives from which to work, but selection of specific objectives has been left to teacher intuition. The problem is that objectives which are formulated in this way are rarely meaningful. The role as motivator necessitates precise statement of objectives, otherwise teachers will motivate students to learn things not needed.

Diagnosis involves assessment of learner characteristics—performance level, learning style and rate, self-image, attention span, physical health, etc. This is closely related to objectives formulation and results in the formulation of new objectives. Sometimes formal analyses are employed for diagnostic purposes. However, too often diagnosis is a random intuitive teacher process, resulting in motivational devices which are misapplied.

Prescription depends upon objectives and diagnosis. While many instructional alternatives are available to teachers, there is little available to tell a teacher about the prescriptive task—putting together diagnosis with instruction for the purpose of meeting the stated objective.

Instruction occurs in every classroom and is contributed to by a variety of persons—media developers, teachers, students, etc. Despite extensive advances in instructional media, the lack of advances in developing a

specific role as motivator is evident in classroom results from two stages of media development: 1) display properties of media are promoted essentially to enhance student motivation; 2) reliability of media to produce results, particularly in the development of programmed instruction, assumes that student success is the built-in motivator. However, neither has proven to be a strong motivator in and of itself. Initial student excitement over the attractiveness of media display wears off and many students find programmed instruction to be tedious after the novelty is past. Teacher intervention as a motivator in support of such technology is lacking.

Evaluation reveals whether implementation of the system has resulted in student achievement. While methods of precise evaluation are available, too often daily evaluation is intuitive, unplanned, loosely constructed, and casual. In the absence of knowledge of real student success, praise-punishment motivational devices are meaningless.

The above components plus motivation are a total system which applies common sense labels to the events of a formal learning environment. Research that applies directly to motivation which can be implemented in the classroom is based on behavior theory which assumes that all behaviors, both desirable and undesirable, are learned responses. Persistent undesirable behavior has three causes: 1) positive reinforcement of the behavior, 2) failure to reinforce the desired behavior, 3) inappropriate use of negative stimulation and punishment.

A method based upon behavior theory which can be used to improve the teacher's role as motivator is contingency management. At the base of successful classroom implementation is contingency contracting. There are 10 concepts that apply to contingency contracting. The first five apply to reward; the last five describe characteristics of proper contracting: 1) Reward immediately--reinforce only adequate performance of the desired behavior; 2) Reward small approximations--make sure that objectives are not overpowering. If that is true, no amount of reward will promote desirable behavior; 3) Reward frequently with small reinforcers--tasks should be designed around the shortest attention span in a group; 4) Reward accomplishment rather than obedience; 5) Reward performance after it occurs, not before; 6) Be fair; 7) Be clear; 8) Be honest; 9) Be positive; 10) Use

contracting systematically—always reinforce based upon clear understanding of the rules of the contracting system.

It should be mentioned that a teacher consultation model using an operant approach for changing teacher behavior (Halfacre, 1973) reflects the incorporation of such learning techniques as pinpointing behavior, reinforcement, and shaping. When dealing with undesirable behavior, the teacher is encouraged to measure the frequency of the undesired behavior and choose a positive reinforcement with which to reward the child when the undesirable behavior occurs less often.

Behavior modification techniques to enhance the role of motivator can be incorporated into the teacher preservice or inservice program as they have been at Glassboro (Pennsylvania) State College (Brent & Harris, 1973). A 13-module cluster for individualizing instruction in behavior modification at the college level has been developed. Adapted descriptors of the titles of the 13 modules are indicative of the input, process, and results of classroom implementation of the system: 1) write instructional objectives; 2) define operant terms; 3) define specific operant measurement techniques; 4) analyze behavior in operant terms; 5) identify operant measurement techniques to be applied; 6) record operant behaviors; 7) specify the situation in which measurement takes place; 8) review operant study; 9) measure social behavior; 10) measure academic behavior; 11) modify social behavior; 12) modify academic behavior - 1; 13) modify academic behavior - 2.

Better teacher performance in all areas of the classroom learning system provides a significant increase in learning. However, even the addition of a teacher trained in the role of motivator, based on behavior learning theory, will make a significant increase in learning results.

## RESEARCH: NEW ROLES, NEW ATTITUDES

Field research provides some insights into the current effect of technology on new roles and related teacher attitudes. Steward and Lowe (1970), reported the results of a study which centered around two concepts: 1) how does the teacher feel about working in a school that stresses individualization? 2) what does individualization mean? On the basis of data collected from interviewing specialists and classroom teachers who worked in an individualized system, the following general results were described.

The general level of personal satisfaction expressed by teachers was quite high. While some teachers felt a loss of status, those who had a basis for comparison (who had worked in both individualized and traditional settings) did not feel a loss of status. However, a lack of role clarity was expressed. There appeared to be two factors at work here: 1) lack of structure allows teachers to be more creative than possible under the constraints characteristic to the traditional setting; 2) the same lack of structure which allows for creativity creates feelings of anxiety relative to role expectations. Preparation of curriculum materials produces high satisfaction for those involved, but produces high anxiety for those who choose not to participate.

The second set of questions dealt with definitions of individualized instruction. Five previously arrived at definitions were presented to teachers who ranked them in their order of importance in creating an individualized system as follows: 1) students select their own materials, 2) students progress at their own rates; 3) teachers spend a great deal of time in individual counseling, 4) students work independently outside the regular classroom situation, 5) many paths are provided to reach the same educational goal(s), and each student may select the best personal one.

While this approach is reminiscent of the "whole child" approach of the forties, it is really quite different. The role of the school in the child's personal development is emphasized, but it is based upon the needs of society as well as those of the individual. As a result of such philosophy and practice, a new teacher's role emerges with importance placed on helping the individual in his or her own personal-societal needs development.

A second study which predicts new roles for teachers in the area of innovation was based on studying the characteristics of present role functions in the innovative Nova School, Fort Lauderdale, Florida (Flynn & Chadwick, 1970). Essentially the findings from this study showed that in comparison to teachers in traditional classes, teachers in innovative classes spent: 1) less time in presenting subject matter information; 2) less time in the management of cognitive activities through the use of noncognitive directions; 3) more time in traffic control; 4) more time using noninstructional materials for student management; 5) more time getting supplies and materials for

students; 6) more time making evaluative comments about students; 7) more time giving grades to students and discussing grades; 8) more time in housekeeping chores, such as cleaning equipment; 9) more time giving directions of a noninstructional nature; 11) more time in events coded as "no observable relevant activity"; 12) less time asking questions and selecting students to answer questions; 13) less time interacting with the whole class; 14) about the same time interacting with individual students.

In the above situation, the teachers tended to have less direct control over subject-matter acquisition, but spent more time interacting with individual students.

These results have some very strong implications for both teacher preparation and staff organization. First, in the area of teacher preparation, Pearson (1975) expressed fear that individualized instruction could well result in neglect of the central skill of teaching--the communication process. Teachers must communicate effectively with a wide range of personalities and do so with great skill. Therefore, teacher education must focus on the process of communication as well as the competencies of performance and content. Communication is only enhanced and developed through group process.

Another dangerous implication of individualizing and organizing instruction into modules and of teacher specialization, is the lack of students being able to perceive how all the parts fit into a comprehensive or interdisciplinary whole (Peters, 1978). Teachers and teacher training programs must address themselves to the development and enrichment of social skills without losing sight of the importance of basic skills as the foundation of a complete education.

## DIFFERENTIATION OF STAFF: A TECHNOSTRUCTURE

If one looks closely at the results of the previously mentioned study conducted at the Nova School, the implications for poor utilization of professsional time under an individualized system are apparent. This coupled with other indicators of technological-support systems' needs in earlier parts of this report, leads to the description of a differentiated staff organization which is required for efficient system utilization with increased learning results.

The idea of staff differentiation is not necessarily new. What is new is the foundation for differentiation in technology: the differentiated technostructure (English, 1970). The model for differentiation is based upon a medical paradigm (doctors, nurses, nurses aides, etc.) which has been translated and applied to education. Liberman (1960) developed a model for schools based upon the above paradigm and described its advantages as: 1) provision of a high level of technical competence in the school; 2) inservice training in the real world of the school, rather than the nonreal university classroom; 3) attraction of quality personnel at top level salaries and retention of that personnel; 4) low level of teacher turnover, confined to less skilled levels of the teacher organization; 5) a cost/saving in that all personnel would not be paid a "professional" salary. According to English (1970), all models for a differentiated staff are refinements of Lieberman's concept.

The following characteristics identify a differentiated staff as a technostructure (See Figure 2): 1) a definite hierarchy of specialized personnel

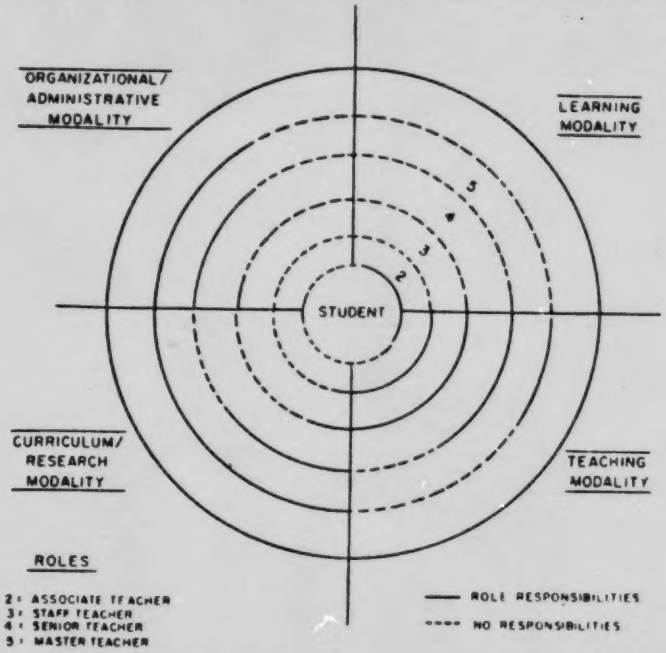

ORGANIZATIONAL/ ADMINISTRATIVE MODALITY
LEARNING MODALITY
CURRICULUM/ RESEARCH MODALITY
TEACHING MODALITY
STUDENT
2
3
5
ROLES
2 = ASSOCIATE TEACHER
3 = STAFF TEACHER
4 = SENIOR TEACHER
5 = MASTER TEACHER
ROLE RESPONSIBILITIES
NO RESPONSIBILITIES
ROLE ANALYSIS: The relative emphasis of roles of staff differentiation models may be calculated by determining where roles stress one or more of the modalities above. The Temple City Model places major emphasis upon (1) teaching responsibilities, (2) curricular responsibilities, and (3) organizational responsibilities as the modes of differentiation, with secondary emphasis upon learning theories as a base of staff differentiation. This is fairly typical of most models being developed today. The student role may be read as that of one who is primarily concerned with the learning modality, but who may do some instruction (peer teaching), exerts some influence on curriculum development, and has some organizational responsibilities.

Figure 2 (English, 1970.)

CLASSIFYING TEACHER ROLES OF FOUR TAXONOMIC MODALITIES OF STAFF DIFFERENTIATION

around a new type of collegial organization; new types of decision-making groups are part of the technostructure: highly specialized teachers whose salaries are equivalent to, or surpass, that of some administrative positions; 2) diffused decision-making reflective of many diversified and specialized groups within the organization; the latitude provided to individual schools to deviate from norms of bureacracy are critical to this type of structure; 3) key roles, which are viewed as "linking pins" to different working groups, require some upward influence so that they can facilitate more effective communication; 4) provisions for self-correction and change which are necessary to maintain relevancy to the students' specific learning objectives should be specified prior to model development so that when feedback occurs, the model can change course and be self-correcting; 5) the principle of a free market should be implemented with education placed on a performance basis and results freely offerred to the market. Standardized procedures must give way and freedom to allocate resources must be provided if innovation is to occur.

The English model (1970) incorporates some unique features that have great implication for both pre- and inservice programs. First, is the emphasis placed upon competency and performance as proved through defined, regular evaluation procedures. Unique here, is the fact that performance is evaluated by those who receive the service. Second, is the collegial organization of the structure. In comparison to traditional administrative organization in which communication channels are one-way directional, down or up through the structure, the collegial organization is open, diffused, even circular. Communications are directed to the persons needing the information regardless of the source or the recipient's position in the organizational structure. Third, roles are clearly defined and filled on the basis of individual competence and skill, rather than time spent in the system. This organization allows for interns, student teachers, and teacher aides to be considered part of the organizational structure both from a functional and a fiscal point of view. Fourth, inservice education is moved from the university site to the school. This not only dovetails with the partnership view of university-school developed programs of teacher training, it provides a ready facility in public schools where differentiation of staff has already been implemented.

INSERVICE: ROLES AND NEW DIRECTIONS

School-based programs of inservice training are both necessary for and facilitative to the new roles resulting from technologically-based instruction. Individually Prescribed Instruction (IPI) previously referred to in this report, provides an example of such an inservice training program. It has both individualization and humanization as its primary focus. It is based upon new role-needs, is school-based, and is the result of a partnership in education.

The teacher's role in IPI is one of diagnostician, selector of human and material resources, and tutor. Several training programs were developed to train teachers in the use of this particular system. Results of these training programs (Scanlon & Brown, 1970) indicate that: 1) teachers need to be trained to practice "what they preach"; 2) teachers, when retrained in the use of specific procedures of a technologically supported system, tend to focus on the mechanics of the system. From this feedback, the training program was modified to include a conceptual model of individualization.

In addition to the inservice training of teachers, school principals were trained to assume responsibility for retraining the staff. This put the principal's role into that of instructional leader with the ability to help staff refine an instructional system. The administrative training program provides experiences that enable an adminstrator to: 1) learn the operations and procedures of the system; 2) work with program materials and resources; 3) learn the administrative tasks involved in implementing the system; 4) develop strategies for training teachers; 5) develop communications skills useful in the system; 6) formulate and implement plans for operating the system in his or her school. Experience from these training programs indicates that administrators generally need help in areas of organization, communication, and analysis of data.

Inservice training has a significant role in staff differentiation also. Since teacher aides and paraprofessionals are a valuable part of such an organization, the successful operation of each teacher-aide program depends upon the development, implementation, and utilization of an adequate inservice (and preservice) education program (Calvin, 1975). The training aspects of such a program should be based upon the needs of aides, teachers, and administrators who are involved. A study at Indiana State University to

ascertain the problems and issues was described by Calvin and indicates a definite need for development of both pre- and inservice programs which promote interaction and cooperation among aides, teachers, and administrators while they work as a team facilitating student learning.

Also, at the preservice level, teacher preparation must include special programs designed to train individuals at the paraprofessional (teacher-aide) level.

## FUTURE IMPLICATIONS FOR INSERVICE PROGRAMS

Underlying new roles in technology, and more efficient utilization of present resources, lies the need for a closer relationship between university, school, and educational agencies which can be operationalized to promote basic research and development that provides clearer understanding of the implications of technology on education and teaching.

This enlargement of the operational system magnifies the size of the task to be accomplished in terms of program development, implementation, and management. However, it maximizes the quality of the product. If teacher preparation institutions do not respond to the changing needs of schools, schools will be forced to seek alternative sources for preservice training (Allen & Mackin, 1970).

Some of the possible alternatives are: 1) inservice training at the preservice level through the preparation of teachers who are adaptable to various settings, amenable to change, and trained as change agents; 2) in-house training in which a school system operates the total preservice program to meet the special needs of the system. This might be done through the creation of a trained staff from within the school system or through contractual agreements with training institutions or private agencies; 3) open-bidding procedures where a school system places bids on the market for a given number of teachers with certain characteristics. The lowest bidder—university, private institution, etc., — would agree to meet the contract requirements; 4) private enterprise would be influenced to train educational specialists to prepare teachers if school districts should begin to "purchase" teachers and, thus, possibilities for a profit-making enterprise would be opened; 5) private institutions which would be comprised

of liaisons between universities and schools, funded through one or more sources, is another possibility.

In order to keep the process of training potential teachers a prerogative of the educational system per se, that system must adapt to meet the changing needs of society, schools, and individuals. One way to approach this adaptive process is to determine the necessary elements of teacher preparation, develop and test new models on a comparative basis, then combine and incorporate the successful features of each into the best program to meet the unique needs of the community who will receive its graduates. The next chapter provides a summary of exemplary programs and can be used as a basis for such study and the subsequent design of future-oriented teacher education program(s).

"In order to provide better education, the battle is not in convincing the profession and the public that solutions lie in doing the present job more efficiently, but in redefining the problems and inventing new solutions." (English, 1970)

CHAPTER TWO

Exemplary Programs of Teacher Preparation

and

Models for Teacher Centers and Inservice Programs

# INTRODUCTION

"A dynamic technological society requires an educational system which is in touch with the real world and which can cope with and foster meaningful change, and which can help society tolerate tentativeness." (Cady & W. C. Allen, 1970.)

The teacher's new role is significantly that of change agent. The teaching act and the teaching role are subject to continual change, therefore, teachers must be prepared to meet the changes being imposed upon them from within and from outside the educational system. This society requires new approaches to teacher preparation with additional objectives of openness to experience, tolerance for change and ambiguity, and concern for stimulating and freeing individual uniqueness.

Bases for the development of new teacher preparation programs are: 1) Since on-the-job performance separates the effective from the ineffective teacher, professional preparation should be based upon performance objectives and behavioral outcomes; 2) If professional training programs are to be consistent with learning theory, they must permit students to progress at their own rates, in manners consistent with personal learning styles and characteristics; 3) If programs are to be relevant, all agencies affected by education must participate in their development; 4) Because continual change in society is occurring, preparation must be looked upon as a continuing process; the beginner cannot be expected to master all the necessary competencies, therefore continuing inservice professional education must be provided.

In the state of Washington (USA), five principles underlie new standards for teacher preparation programs: 1) The standards themselves must be performance standards for the agencies and institutions involved in establishing the behavioral criteria and the preparation programs; 2) Programs must be process- rather than content-oriented; 3) Programs must emphasize and encourage change; 4) Programs must be designed as open systems; 5) Programs

must place evaluation as an integral part of the feedback process within each program,

Based upon these standards, any new design for preservice teacher education should require that: 1) candidates have more experiences in realistic settings early in the program; 2) curriculum and experiences be designed to provide for individualization in achieving specified performance behaviors; 3) all preparation experiences provide opportunity for candidates to apply theory in realistic settings; 4) teacher preparation accomodate differentiation of staff requirements; 5) programs provide experiences to enable candidates to develop personal/human competencies as well as competencies in subject matter and pedagogy; 6) responsibilities for beginning teachers be different from those of experienced teachers because preparation should continue during the initial years of teaching.

Three kinds of certified personnel are identified: 1) teachers—primary responsibility is instruction; 2) administrators—primary responsibility is school administration; 3) educational staff associates—specialized support services, such as media, counseling, etc.

Based upon the assumption that performance levels will vary, four levels of performance are identified within each certification area: 1) preparatory—student teaching, laboratory, internship; 2) initial—the beginning practitioner; 3) continuing—full-fledged professional who has demonstrated competency in all specified areas; 4) consultant—personnel who have the responsibility for preparation of personnel.

These guidelines established by the state of Washington are reflective of new directions in teacher preparation. These and other factors integral to new and changing roles for teachers will be found in the exemplary programs described in this chapter.

Teacher preparation programs which are summarized in detail are divided into four major categories: developmental, behavioral, humanistic, and behavioral/humanistic. While each program is not a "pure" example of any of the descriptors used, each is classified by what appears to be the major thrust of the program. Programs are grouped by the following criteria: 1) developmental—the emphasis is on progressive developmental

experiences for the teacher candidate which provide regular growth from the beginning preservice stage to the completed stage of initial preparation; 2) behavioral—the emphasis is on performance-based demonstrations of competency, based on task-analysis, performance-stated objectives and outcomes; teaching is viewed as a science and/or set of technical skills; 3) humanistic—the emphasis is on competencyin areas of intrapersonal and interpersonal relationships, recognition of human uniqueness, an interdisciplinary base of teacher education which assumes teaching to be an art; 4) behavioral/humanistic—the emphasis is on both performance of specified skills and recognition of the qualities and needs of the human condition, both individually and collectively.

## DEVELOPMENTAL

The emphasis is on progressive developmental experiences for the teacher candidate which provide regular growth from the beginning preservice stage to the completed stage of initial certified preparation.

Michigan State University

## BEHAVIORAL SCIENCE ELEMENTARY TEACHER EDUCATION PROGRAM (BSTEP)

### OVERVIEW

The program is a preservice-inservice teacher preparation program which emphasizes developmental experiences from the freshman year through a full year of internship. It is a program based on joint responsibility of participating institutions which provides a continuous, developmental approach to preparing candidates to assume full professional responsibilities. Major program areas are general-liberal education, scholarly modes of knowledge, professional use of knowledge, human learning, and clinical study.

There are eight special program features: 1) Teacher education and general education are comprehensively interrelated; 2) Skills and knowledges from the behavioral sciences are focused on educational problems; 3) Cross-cultural studies are offered; 4) Techniques facilitative to the use of new teaching strategies are provided; 5) Continuous appraisal provides evaluation of selected experiences and of the total program; 6) University/school resources are cooperatively utilized; 7) An extensive information storage/retrieval system allows cross-analysis of the curriculum; 8) Differentiated programs are offered--preschool, primary, middle school, subject specialization, general classroom teaching.

Four goals underly the program: 1) broad general education in humanities, natural and social sciences, 2) research and clinical experiences are systematically introduced into the process of decision-making for educational improvement, 3) new kind of clinical base for early professional experiences, 4) preparation of a new kind of teacher who engages in teaching as a clinical practice, understands human learning, and assumes the role of a responsible change agent.

### RATIONALE

Since behavioral sciences dominate the task of educational activity directed toward human development, the key to the program is a clinical behavior style based on the behavioral sciences.

SELECTION PROCEDURES

Selection is based upon input characteristics of students, plus their progress and effectiveness as monitored by the program team.

PROFESSIONAL PRESERVICE COMPONENT

The undergraduate program includes: 1) broad liberal education, 2) structure of various disciplines emphasizing methods of inquiry and learning unique to each one, 3) study of human learning, 4) analytical study of the teaching act in different learning environments, 5) year of internship as part of a teaching team.

Professional use of knowledge is a program block which provides the prospective teacher opportunity to translate knowledge into action in the following areas:

Reading. The focus is on developmental reading with optional experiences teaching reading and the content areas and for recreation.

Language Arts. The focus is on listening, speaking, and writing skills supported by skills of spelling and handwriting. Candidates are provided with strategies for studying objectives, instructional procedures, and evaluation techniques.

Social Studies. The focus is on informed decision-making through sensitizing students to a range of possible future decisions and providing settings of actual and simulated classrooms, microteaching, self-study projects, clinical experiences, and laboratory and field experiences.

Science. Autotutorial experiences, small- and large-group instruction provide study of elementary science philosophy, curricula, methods, skills, material selection, media utilization, and evaluation.

Mathematics. The student translates previous mathematics learnings into concepts and skills for children.

Human Learning. The first undergraduate experience focuses on learning theory and research. The second experience, concurrent with the internship, focuses on environmental systems which influence human growth. This enables the candidate to view the school as a social institution with intersocietal relationships and to use the basic concepts as tools of analysis, understand the contributions of nonschool agencies, and understand social factors which influence pupil development.

Clinical and Field Experiences block is client-related, includes manipulation of instructional variables and feedback for the improvement of instruction. Tutorial. During the first and second year of the program, these one-to-one experiences with children provide opportunity for role identification, self-screening, and determination of the reality of the candidate's personal child-model.

Career-Decision Seminar is aimed at helping students to make a decision about becoming a teacher, age of children preferred, preference of general or specialized role, and if specialized, what area? [See Figure 3.] The seminar also provides the first clinical experience designed to collect statistical and personal information on students for use as base-line information for study programs and follow-up tutorial experiences. It introduces the role and functions of the teacher, provides classroom simulation for reality testing, and provides the first evaluation checkpoint for students.

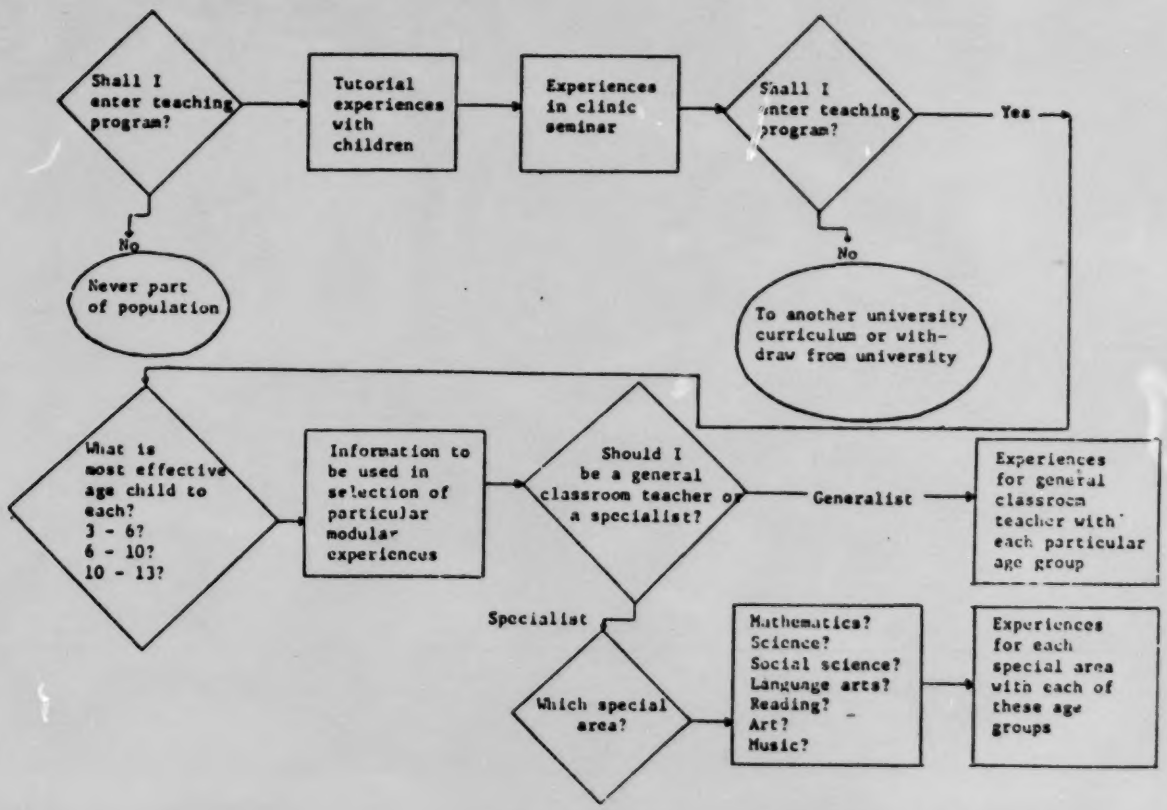



Figure 3

FLOW OF QUESTIONS TO WHICH A STUDENT RESPONDS DURING THE DECISION SEMINAR

Teacher Analysis. The student is provided with opportunities to test the teaching skills through simulation. There are three types of activities involved: student analysis of visually recorded classroom scenes, student participation in classroom simulation, and microteaching.

Internship. Students are assigned full-time to an elementary classroom for one year under the guidance of an intern consultant (highly skilled experienced teacher). Classroom autonomy and responsibility are keys to this experience. It provides opportunity to translate study of human behavior into instructional strategies.

Teacher Specialization. Along with the fields of preschool and primary, new organizational patterns in public schools (middle schools, team teaching) and experimental movements in specific disciplines require a new kind of teacher, specialized by subject area or by age of child. At least 24 modifications are generated by the two dimensions of subject and pupil age. (See Table 1.)

| Teacher specialization | Elementary school | | |
|---|---|---|---|
| | Pre-school | Primary school | Middle school |
| General classroom teacher | x | x | x |
| Mathematics teacher | x | x | x |
| Science teacher | x | x | x |
| Social science teacher | x | x | x |
| Language arts teacher | x | x | x |
| Reading teacher | x | x | x |
| Art teacher | x | x | x |
| Music teacher | x | x | x |

Table 1

PROGRAM MODIFICATIONS

RELATIONSHIP OF THE PROFESSIONAL TO THE ACADEMIC COMPONENT

General-liberal education and scholarly modes of knowledge are the two discipline-centered aspects of the program. General-liberal education provides the broad core of the program. Scholarly modes of knowledge differ from liberal education in two ways: 1) the content is more applicable to classroom

teaching; 2) models of styles of inquiry are stressed.

The objective of general-liberal education is to relate student knowledge to the study of human behavior. Rather than a series of survey courses, the program provides a basic core of experiences emphasizing the contributions of various liberal arts and sciences disciplines to an understanding of man, his behavior, ideas, society, and world. The purpose is to develop basic analytical tools that are prerequisite to intelligent decision-making. General-liberal education is divided into three components:

Humanities Component. The principle characteristic is the involvement of the student in questions of value, such as "What is man?" First experience is a laboratory workshop in literature, art, and music followed by an integrated study of the humanities.

Social Sciences Component. Geography, anthropology, sociology, political science, and economics are introduced as systems. Decision-making strategies of the social sciences are studied through carefully sequenced experiences. The emphasis is on the interaction of social forces and their impact on education.

Natural Sciences Component. The effect upon culture of the natural sciences and mathematics is the central theme.

Scholarly modes of knowledge opens the door to disciplined inquiry into areas related to the elementary school curriculum.

Linguistics. Basic goals are the exploration of the nature of language as determined by linguistic theory, distinguishing fact from opinion about language, investigation of research on grammar as it relates to the teacher's role.

Communication. The emphasis is on verbal and nonverbal communication patterns, cross-cultural contacts, self-understanding of encoding and decoding skills and choices of channels. The key behavior is the ability to analyze communication events and patterns in relationship to the teacher's role.

Literature for Children. A combination of literature and graphic arts with emphasis on categories of literature and their characteristics, media and styles of art in children's books.

Fine Arts. There are three aspects: art, music, dance and drama with emphasis on the mode of perception and creativity in each area. Teaching art values,

concepts, and productive behavior to children is basic. Students are provided with experiences in various media.

Social Science. The focus is on social science theory and research with emphasis on interaction personality and basic social systems.

Natural Science. Experiences are designed to develop competency using ideas and materials appropriate to elementary science. Examples are derived from geological, biological, and physical sciences. The instructional strategies are lecture, independent study with the laboratory as a support system.

Mathematics. Foundations of arithmetic, algebra, and geometry form the core. Instructional strategies are lecture, independent study with immediate application in the mathematics laboratory.

INSERVICE COMPONENT

The program is based upon joint responsibility of participating institutions for the continuing education of the staff. Schools are clinical settings for preservice observation, analysis of teaching behavior, and the internship. Joint school-university projects are conducted in inservice education based on this relationship. The program necessitates flexibility to accomodate individual differences, field of specialization, and teaching skills. Extensive leadership training is provided to selected, highly skilled teachers who have completed masters degrees. This leadership program is individualized within areas of research, instructional technology, clinical practice, and educational strategies.

FACULTY REQUIREMENTS AND STAFF UTILIZATION

To provide a dynamic faculty, well-versed in clinical practices, two procedures are recommended: 1) program development-trial-evaluation cycles with rotation of staff responsibility and emphasis on field work to validate the professional role through reality testing and to provide feedback for redesign and modification of materials and modules; 2) access to current research and scholarly works through consultation services provided by experts in the field(s).

EVALUATION COMPONENT

A carefully designed evaluation system which includes cognitive, affective, psychomotor domains, and supports program development is a necessity.

Information Retrieval System. A complex computerized data storage/retrieval system facilitates evaluation. The system handles and processes alphanumeric data and is capable of handling natural language and conducting categorical and/or logical searches among documents or searching for main ideas within a given document. Similarities in ideas, experiences, objectives, evaluative devices, and materials can be examined from among many parts of the program. A modular approach provides flexibility in implementation while providing explicit detail and bases for program evaluation and cost-analysis. Complete student-experience assessment is also provided. Evaluation leads to constructive program development, a regeneration integral to the clinical approach emphasized in the program.

PROGRAM MANAGEMENT

An extensive, viable, and flexible management support system responds to the complexity of program needs in the following areas:

Program Development Subsystem. Program development is accomplished by revision of current modules, input of new ideas and modes of inquiry from scholars, addition of new program tracks, and revision in clustering and sequencing of instructional modules.

Evaluation Subsystem. Data retrieval plus direct feedback from personnel is used to modify, expand, delete materials and experience modules.

Clinical Experience Subsystem. The viability of the program and its components is assessed. Consultation with program development personnel results in precisely stated objectives; use of analytical instruments and analytical tools of behavioral sciences to observe, measure, and assess individual and group action; suggested research designs to study program effectiveness.

Management Planning Subsystem. This assists other subsystems in systems planning, systems development, and systems analysis. Expertise in the use of PERT, PERT-COST, PPBS, and other management planning tools are located within this subsystem. The objectives are efficiency of operation coupled with adaptability.

BEHAVIORAL

The emphasis is on performance-based demonstrations of competency, based on task-analysis, performance-stated objectives and outcomes; teaching is viewed as a science and/or set of technical skills.

Florida State University

A PROGRAM FOR THE PREPARATION OF ELEMENTARY TEACHERS

OVERVIEW

The program is built upon the relationship of social, political, and economic realities to teacher education and to elementary school programs. While the underlying philosophy is broad, drawing upon social-cultural theories of impact on the educational system, it is essentially behavior-performance oriented in its operational aspects.

The program reflects both a growing understanding of the psychological dimensions of learning problems involved in the task of teacher preparation and the success achieved in systematically analyzing the act of teaching. There are nine general program aspects: 1) Teacher preparation is viewed as experiences designed to enable trainees to meet stated performance criteria; 2) Trainees move from one experience to the next on the basis of demonstrated ability to meet the performance criteria; 3) Provision is made for applying theory to the act of teaching; 4) A significant part of teaching is viewed as a definable and describable set of technical skills in which candidates can be trained; 5) The final phase of the preservice program is extended into, and becomes part of, the initial years of teaching; 6) A computerized management system is used to monitor student success, provide information on trainees and staff for a variety of required purposes; 7) Faculty roles and relationships are redefined to be consistent with program requirements; 8) Admissions criteria are consistent with performance goals; 9) Staff specialization and differentiation is recognized, dealt with, and provided for in the program.

Overall Program Design

The program is divided into three distinct phases: 1) underclass, 2) preservice, 3) inservice. Most students will require six years beyond high school to complete the program, but there is built-in flexibility for the student who may require more or less time. [See Figure 4.]

Phase I: Underclass. The equivalent of the first and second years of under-

graduate study, it has two components: 1) General education—a) required studies, b) elective studies; 2) Preprofessional education—a) behavioral studies, b) early awareness experiences. Admission to the professional program occurs here.

Phase II: Preservice. This is the equivalent of upper undergraduate education. There are two components: 1) Professional preparation (theory and practice)—a) formulating objectives, b) selecting and organizing content, c) selecting and executing content, d) evaluating outcomes, e) behaving professionally; 2) Academic preparation—a) areas of concentration, b) elective studies. At the end of the preservice phase, the terminal outcome is a baccalaureate degree and provisional certification.

Phase III: Inservice. The inservice phase is the equivalent of two years of graduate study beyond the baccalaureate degree. There are two components: 1) Experiencing teaching—a) refining and extending skills, b) serving as a member of a professional team, c) assuming professional responsibility; 2) Studying teaching—a) problem-centered study, b) discipline-centered study c) differentiated-role study. The terminal outcome is a master's degree and permanent certification.

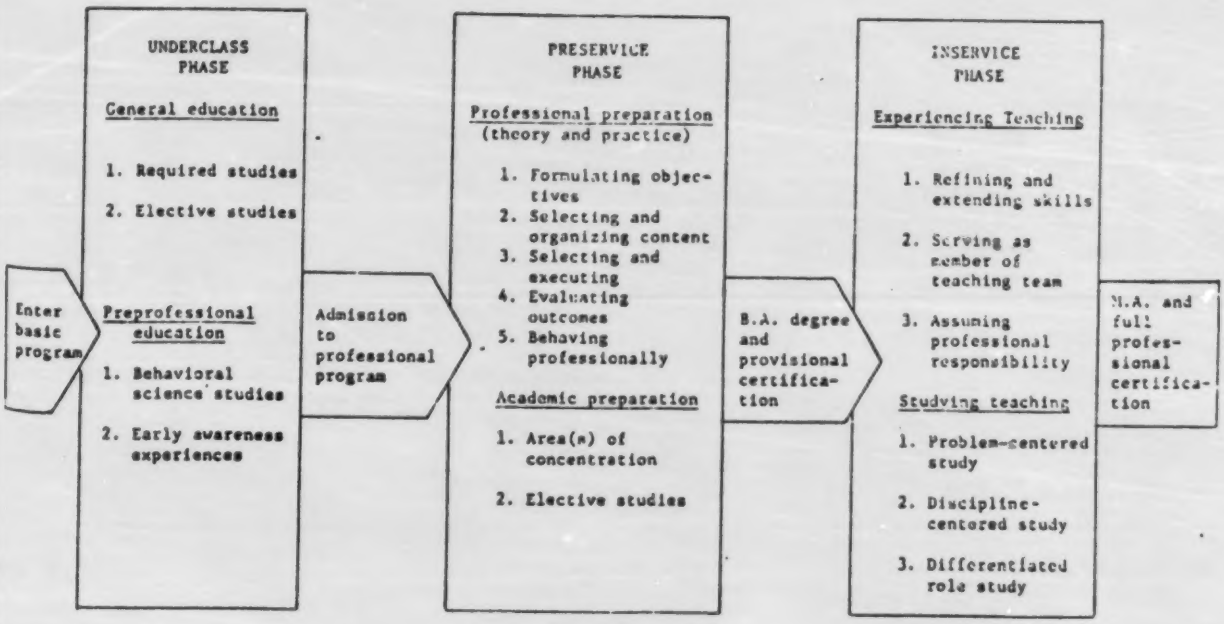



Figure 4

A THREE-PHASE PLAN FOR PREPARING ELEMENTARY TEACHERS

PROGRAM GOALS

The teacher will: 1) plan for instruction by formulating objectives in behavioral terms that are both observable and measureable; 2) select organized content matched to the logic of the content and the psychological demands of the learner; 3) employ appropriate strategies to obtain desired behavioral objectives; 4) evaluate instructional outcomes in terms of behavioral changes; 5) show competency and willingness in accepting professional responsibility and serving as a professional leader.

SELECTION PROCEDURES

Based upon the assumption that training alone is not sufficient to produce high quality professional teachers, criteria for selection include high academic-intellectual ability, strong/lasting commitment, and good mental health. The procedures enabling selection are: 1) first-hand data made available to students about teaching which enables them to make reasonable and informed decisions about admission; 2) formal and informal data on qualifications of interested candidates relative to admission requirements.

PROFESSIONAL PRESERVICE COMPONENT

There are five major features of this component: 1) self-paced experiences (not courses), 2) criterion-referenced performance evaluation (not standard grading), 3) sequenced theory-practice-contiguity, 4) progressive synthesis experiences, 5) computerized management control system with feedback capabilities. These components are reflected through specific aspects of program structure: 1) disappearance of formal courses in professional education, 2) provision of real or simulated teaching practice contiguous with trainee learning experiences, 3) absence of a formal grading system, 4) elimination of traditional student teaching at the undergraduate level.

RELATIONSHIP OF THE PROFESSIONAL TO THE ACADEMIC COMPONENT

Underclass Phase. The academic component comprises 2/3 of the learning experiences; the professional component comprises 1/3 of the learning experiences. Entrance to the preservice program is based upon individual assessment of prerequisite skills determined by a locally designed diagnostic test. The purpose of this test is determination of the best placement in the

training sequence, provision of appropriate remedial work, and the establishment of an estimated time for program completion.

Preservice Phase. The academic component comprises 1/3 of the learning experiences and the professional component comprises 2/3 of the learning experiences.

INSERVICE COMPONENT

Based upon the assumption that teacher training programs cannot remain institutionalized within the university, the program requires institutional partnerships. There is a location shift to the public schools where a community "portal school" is established by the partnership for on-the-job training.

Portal schools have common characteristics: 1) The leadership is favorably inclined toward innovation; 2) They utilize new curricula; 3) There is differentiated staffing--paraprofessionals, differentiation of teacher roles, modular scheduling; 4) There is considerable use of new teaching media.

Portal schools serve the model program by: 1) insuring an easy transition from university preservice to full responsibility of the inservice phase; 2) enabling the preservice program to operate in the real world--a community reflecting the goals of the program and the local school district; 3) providing feedback to determine needed changes in preservice and inservice phases of the program.

FACULTY REQUIREMENTS AND STAFF UTILIZATION

The new roles required by the program make the retraining of school faculty a major problem. New staff requirements exist in both the organizational and utilization areas. New faculty roles are required in areas of administration, student personnel, teaching-counseling, selecting and producing materials.

New demands on faculty-time requirements call for complete reorientation of traditional activity patterns. New skills are needed to produce materials for a highly individualized program.

EVALUATION

Evaluation is functionally built into the preservice program. Basic training sequences are designed to elicit responses to each input followed by immediate feedback to the trainee. Since performance-based evaluation is always an

assessment of whether the trainee needs the specified performance criteria, program evaluation is built in.

The program follows the trainee to the inservice level during the first two years of teaching, automatically providing early follow-up studies of teaching performance. Both at the pre- and inservice levels, built-in evaluation provides feedback on both trainee and program.

PROGRAM MANAGEMENT

A comprehensive computer management control system serves three purposes: 1) Trainee progress is monitored with data on success factor which is available to the trainee and counselor-professor as needed; 2) Summary data on all trainee progress is made available to the project manager on a regular basis; 3) Analysis of data needed for program evaluation and modification is also provided.

Two additional computer management techniques are proposed: 1) Computerized simulation model, interrelating all program elements so that change conditions in one element automatically bring adjustments to every program element; 2) Special cost projectors and cost-accounting procedures require a planning program budgetary system.

The University of Toledo

## EDUCATIONAL SPECIFICATIONS FOR A COMPREHENSIVE ELEMENTARY TEACHER EDUCATION PROGRAM

The task of developing specifications for the Toledo program was conducted by a consortium of 12 state-supported Ohio universities, the Research and Development Center for Cognitive Learning (University of Wisconsin), and a private Arizona consulting firm.

### PROGRAM GOALS AND RATIONALE

The innovative aspect of organization focuses on the development of five contexts around which the program specifications are built: instructional organization, educational technology, contemporary learning process, societal factors, and research. Contexts are divided into major subject areas, subject areas into topics. Specifications based upon more than 2,000 behavioral objectives were developed within each of the contexts and its subheadings. The five contexts reflect the following assumptions: 1) Educational technology will play a substantial role in the development of teacher education programs of the future; 2) The instructional organization of the future elementary school will change markedly; 3) The traditional teaching-learning process must be reevaluated and reoriented toward behavioral outcomes; 4) a multicultural society requires consideration and incorporation of societal factors in future teacher education programs; 5) Research has not been incorporated into traditional programs. This must be done to allow research to contribute to the improvement of education.

### SELECTION PROCEDURES

The program identifies six major target populations: preservice, preschool and kindergarten; preservice, elementary; inservice (classroom teachers); administrative; college and university personnel; supportive personnel. Preservice populations must meet institutional general admissions requirements. For the other four populations, their defined association with the education process, such as being a classroom teacher, is the only entrance requirement.

Success within the program, however, is determined by the demonstration of meeting behavioral objectives.

PROFESSIONAL PRESERVICE REQUIREMENT

Training is behaviorally oriented. Each specification, in addition to one or more behavioral objective(s), contains suggested treatment, materials, and evaluation for meeting the objective(s). Instructional treatments vary from traditional instruction to instructional media to simulation and other technology-based methodologies.

There is emphasis on team teaching, both within the program and in the classroom. Specifications were developed which deal with the academic disciplines and skills taught in the classroom. Research and development activities conducted within the school setting and the preparation of instruction for the multiunit school are also emphasized.

While there is some overlap of specifications relative to target groups, not all specifications apply to all populations. Each specification identifies the target population(s) for which it is appropriate. Much of the preservice content is identified for inservice programs of teachers, administrators, and college personnel, as it is content not previously included in their backgrounds.

Professional training is based upon the assumption of a role-differentiated profession. Varied roles, such as master teacher, intern, unit leader, and principal are identified along with specifications for their preparation. Intern and actual classroom experiences are incorporated through the preservice professional component.

RELATIONSHIP OF THE PROFESSIONAL TO THE ACADEMIC COMPONENT

The program assumes that training in the academic disciplines will be a function of the college, schools, or departments of arts and sciences within the implementing institution. Training for the teaching of the disciplines is a function of the college, school, or department of education.

INSERVICE COMPONENT

If present teachers are to be effectively utilized in schools of the future, inservice training is extremely important. Many of the program specifications dealing with research and development apply to classroom teachers and to

administrative and college personnel. A large number of program specifications apply to inservice for classroom teachers. However, a limited number of specifications are identified for a limited-scope inservice program which has specific goals. The process of program development is based upon a set of well-defined goals and the applicable target population. The content of specifications described provide the operational program necessary to meet those goals. (Operational steps of program development are summarized in Figure 5.)

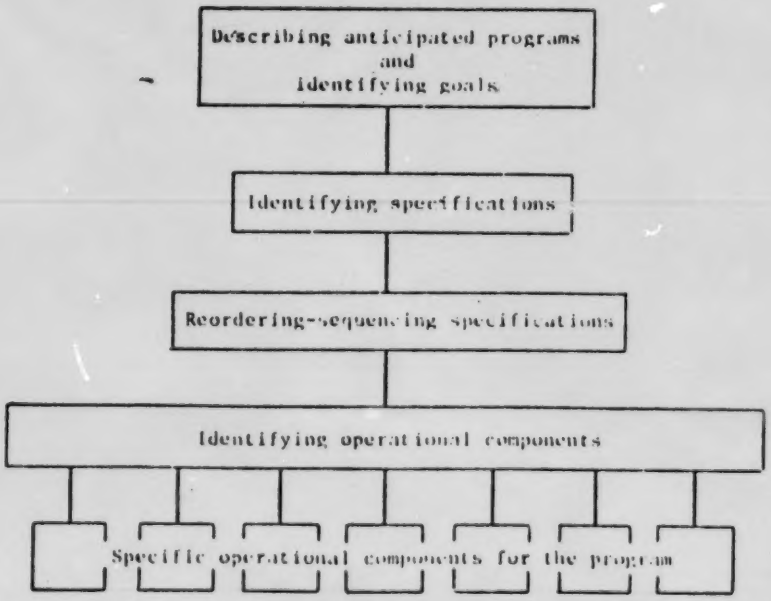



Figure 5

OPERATIONAL STEPS IN PROGRAM DEVELOPMENT

FACULTY REQUIREMENTS AND STAFF UTILIZATION

The faculty and staff necessary to implement the teacher education program are identified as a separate target population. A total of 449 specifications with content not commonly found in the repertoire of college and university educators have been designed for this population. A substantial number of these specifications deal with training for research and development as related to the multiunit school and educational technology. However, a large number of specifications are found within the other four contexts of instruc-

tional organization, contemporary learning process, societal factors, and educational technology per se. Training programs for this population are substantially different than for school personnel, as most college personnel possess expertise in one or more areas relative to those sepcifications.

EVALUATION COMPONENT

The program utilizes two operational definitions of evaluation: 1) Evaluation as part of each specification, dealing with specific materials or procedures which measure whether or not the behavioral objective(s) of the specification has been met; 2) Evaluation in a more general sense as applied to continuous feedback and decision-making throughout the implementation of the program. For this purpose, evaluation design must meet the criteria of validity, reliablity, and objectivity. A set of general steps enable ongoing evaluation and decision-making concurrent with implementation. Context evaluation provides information for planning decisions; input evaluation provides information for structuring decisions; process evaluation provides information for recycling decisions; product evaluation provides information for modifying decisions.

PROGRAM MANAGEMENT

The only aspect of program mangement which is dealt with specifically, is the collection, organization, and analysis of information relative to the evaluation design above. Other areas of program management are not specified as the system upon which this is based must be congruent with the specific data base of the implementing institution.

SUMMARY

The program contains 818 specifications which include in excess of 2,000 behavioral objectives. Specifications within five broad contexts apply to one or more of six target populations. The program is based upon the assumption that the future elementary school teacher will move toward team teaching within the instructional organization of a multiunit school. Each specification is identified and coded according to a numerical code in terms of information contained within the specification. A process whereby composites of specifications may be identified and retrieved for program design and implementation is available.

The evaluative process was designed so that any program designed in behavioral terms can be evaluated at a given point in time with provision for prompt and objective feedback for program correction and modification. This allows institutions implementing programs to complete or modify specifications within the regular course of implementation.

Programs based on the Toledo model reflect the following characteristics: 1) Instructional focus is in contexts of instructional organization and contemporary teaching-learning process; 2) Educational technology and societal factors receive more attention than in traditional programs; 3) Conducting and using research in the educational setting is emphasized; 4) The program is activity-centered; 5) Student involvement is equally divided between individual study and team or group experience; 6) Students have progressive involvement from observation through simulation to direct classroom experience. 7) A wide variety of media supplements the program.

The Toledo model has several strengths: 1) A new context for the organization and instruction of a teacher education program; 2) The composite specifications are flexible and can be organized into various programs; 3) The elementary school of the future and specific skills needed by its teachers are given much attention; 4) All major target populations involved in elementary education and teacher preparation are considered; 5) Professional content that has contemporary relevance and the projected role of the future teacher are included. The program has two points of weakness: 1) Selection of candidates receives little attention; 2) The relationship between the academic and professional components recieves little attention.

Commitment to program adjustment and practical application of specifications are the keys to successful implementation of this model.

HUMANISTIC

The emphasis is on competency in areas of intrapersonal and interpersonal relationships, recognition of human uniqueness, and an interdisciplinary base of teacher education which assumes teaching to be an art.

Syracuse University

## DESCRIPTIONS FOR A COMPREHENSIVE UNDERGRADUATE AND INSERVICE ELEMENTARY TEACHER EDUCATION PROGRAM

The program provides a blueprint for developing and implementing a four-year teacher education program with provision for a fifth-year component adaptable to specialized teacher education. The program is based upon six assumptions: 1) Since there is no proven most effective teacher education program, the door is open for cooperation on the part of educators, students, and researchers to propose and test new possibilities; 2) Since society is undergoing rapid change, a program must be self-renewing to meet future needs; 3) A pluralistic and self-renewing program must be an open system with built-in intention, action, and feedback structures for modification; 4) Self-renewing teachers are required as a condition of (2). This implies continuing inservice education; 5) In recognition of and accomodation for human uniqueness, the program must be individualized and self-pacing to promote self-direction and self-renewal; 6) The program must be based upon cooperation involving schools, universities, and educational industries and agencies.

### PROGRAM MANAGEMENT AND DEVELOPMENT

The management system will be determined by the specific program developed. Management is responsible for facilitating all support and instructional systems and requires three base-line subsystems: program support, information and evaluation, and organizational support. There are five stages of program management development: program design, component design, module design, module construction, and module testing.

Program elements of central concern are instructional objectives, instructional experiences, instructional materials, measurement, and evaluation. Support systems are crucial to self-renewal and are dependent upon the information/evaluation feedback system.

THE PROGRAM

Liberal-professional education is divided into seven preservice components:

Liberal education has a base-line requirement of 18 hours plus additional work which will vary according to the existing requirements of the adopting institution. Liberal education will comprise the entire first and second undergraduate years plus part of the third. Goals are process-oriented with emphasis on self-direction and decision-making. Liberal education is organized to synthesize liberal arts, social sciences, natural sciences, and humanities in a way which enables students to master the art of teaching.

Component One. Three, six-hour, two-semester courses in: 1) changing perspectives in the humanities, 2) changing perspectives in the social sciences, 3) changing perspectives in the natural sciences.

Professional education begins in the junior year and ends in the senior year or in the fifth-year residency.

Component Two: Elementary Methods and Curriculum. It is oriented toward problem-resolution with the implication on continuing process. It is structured in modules which deal with content from basic elementary curriculum, associated teaching methods, and learner appraisal. The component is applied through simulation, microteaching, and tutoring and is given at the junior preservice level.

Component Three: Child Development. It is organized by a sequence of modules which begin in the junior year and end in the senior year. The modules provide active student involvement in analysis and description of techniques, theories, and normative information on child development. The focus is on sensitivity, teacher awareness of children, and understanding child behavior. The goal is to bring student from sensitivity, to careful singular observations, to increased repertoire of observation/analysis skills.

Component Four: Teaching Theory and Practice. The student makes long- and short-range plans keyed to outcomes based on the view of teaching as a decision-making process. It enables skills of wise decision-making by promoting discrimination between increasingly finer differences in teacher behavior, practice of teaching behavior, examination of objectives and preparation of evaluation devices, interpretation and application of

research results to teaching strategies as they relate to outcomes, and practice of decision-making skills. At the junior level, the application is through simulation; at the senior level, the application is through classroom experience.

Component Five: Professional Sensitivity is organized in modules developed around readings, seminars, T-group experiences which begin in the junior year and are concerned with the dynamics of inter- and intrapersonal interaction. There are three groups of modules: 1) understanding self, 2) understanding of skills relative to self as teacher, 3) increasing personal awareness of self as part of the educational system.

Component Six: Social-Cultural Foundations is organized into five groups of modules achieved mostly in senior and resident years. Subject matter is drawn from the social sciences with goals of enabling understanding and/or skills in: 1) social dynamics of educational groups and institutions; 2) social, political, and economic forces affecting schools and schooling; 3) analysis of social situations; 4) analysis of language as a tool for communication and behavior influence; 5) analysis of values education and values judgments.

Component Seven: Self-Directed. This fosters independent self-directed professionally-oriented activities. Defined student tasks are: 1) determining learning outcomes, 2) describing outcomes in terms of behavioral objectives, 3) determining a specialized area for fifth-year study. The student chooses a counselor-advisor (college personnel) for professional assistance and may also participate in enabling student-controlled seminars. The student develops a personal planning and goals paper and achieves these goals through independent activities in the fourth and fifth years.

Operational Aspects of the Senior Year of Professional Study

The six professional components are studied in greater depth. More complex teaching episodes are offerred in a teacher center under team supervision which includes a clinical professor, specialist and clinical teacher, generalist. The purpose is to bring the student to planning, teaching, and evaluation of a series of teaching units in the classroom. The terminal outcome is provisional certification.

The Fifth-Year Inservice Residency

This is an elective component enabling refinement of skills and development of a specialization terminating in a master's degree or equivalent. Coursework in the summer before and after the year of residency provides time for specialization. The teaching assignment is a half-time partnership with two residents sharing responsibility for one classroom and doing independent study the other half-time.

Organization of the Components

Each component is comprised of a series of instructional modules. A module is defined as a planned instructional episode of a duration lasting from a minimum of several hours to a maximum of several months. Most modules have pre- and post-performance measures, although some are designed for continuous measurement.

During the junior and senior year. the student learns and applies learning while proceeding at an individual rate through a series of instructional modules that comprise the six professional components. Application occurs in simulation, microteaching, and tutoring during the junior year. Tutoring and microteaching occur in centers located in elementary schools staffed by trained clinical teachers. Senior year, full-time professional study allows continued work in the modules of the six components and provides a series of increasingly more complex teaching experiences that bring the student, step-by-step, to the point of full responsibility for planning, teaching, and evaluating a series of teaching units. At the end of this year, the student decides upon a program of studies leading to specialization if the fifth-year program is elected.

Faculty Requirements and Staff Utilization

Self-renewal of the teacher is provided for through inservice education. New roles identified for this aspect of the program are openness, flexibility, new closeness in the instructor-student relationship. To facilitate these goals, the program provides for a "protocooperation" of university, school system, educational industries, and regional laboratories to implement and operate faculty-staff development.

Evaluation

Responsility is centered in an information and evaluation support system which provides a basis for program modification, information gathering and dissemination on student success, program assessment in terms of student characteristics as compared to success, and information dissemination to other teacher education institutions.

Unique Characteristic

The unique aspect of the program is that it is based upon an assumption which defines teaching as an "art."

HUMANISTIC/BEHAVIORAL

The emphasis is on both performance of specifieds skills and the recognition of the qualities and needs of the human condition, both individually and collectively.

The University of Pittsburgh

## A MODEL OF TEACHER TRAINING FOR THE INDIVIDUALIZATION OF INSTRUCTION

### OVERVIEW

This program proposes that individualization should be the mode of instruction at all levels of education and in all social situations. Individualization and flexibility are the main program features.

### GOALS AND RATIONALE

The design of any program must accomodate the projected needs of the future. This program utilizes a "minimax" process to keep the program current with future needs. Minimax assures maximum success with minimum effort by utilizing continual feedback from students, faculty, school settings, and community groups for program modification and revision.

Program design focuses on three major points: 1) individualization, 2) learner involvement in planning, executing, and evaluating learning, 3) a specified set of goals with requirements for reaching them.

Individualization emphasizes the human element and assures development of full human potential. Individualization is supported by common findings from fields of learning that indicate individuals tend to learn better when they: 1) actively participate in the learning experience, 2) have opportunity to participate in the selection of what they learn, 3) have immediate feedback on the results of learning, 4) experience success, 5) are expected to succeed, 6) identify with a competent model, 7) work on a task suited to their dominant style of learning, 8) are self-paced or have a choice of pacing.

The program provides for individualization through flexible learning rates, alternate experiences to accomodate different learning styles, and a variety of settings for learning.

The program specifies the following teacher competencies: 1) specifying learner goals and/or selecting from prestated goals; 2) assessing pupil achievement; 3) diagnosing learner characteristics; 4) planning long- and

short-range learning programs with pupils; 5) guiding pupils in their learning tasks; 6) directing off-task behavior; 7) evaluating learners; 8) employing teamwork with colleagues; 9) enhancing self-development; 10) serving as a professional leader and as a change agent in the schools.

SELECTION AND ADMISSION TO PROFESSIONAL EDUCATION

The selection and admission into education is based upon the following general criteria: 1) evidence of interest in children; 2) exhibited success and multiple interests in the disciplines; 3) good communication ability; 4) evidence of success in coping with personal and social problems; 5) self-assurance and confidence; 6) good physical health; broad interests; 8) openness, acceptance, and knowledge-ability about social pluralism; 9) understanding the program and agreeing to work toward mastery.

Admission procedures utilize these criteria in the process of selction and admission. In the admission's procedures, points are provided for recycling and allowing students more time and experience in meeting the general criteria. The first point of admission's decisions is during the interview events. Some students may be sent for further field observations to enhance the reality of their motivations for entering professional education. The second decision point is provided by the faculty review panel which may admit a student, recycle a student, or suggest exit from professional education and entry into another program. [See Figure 6.]

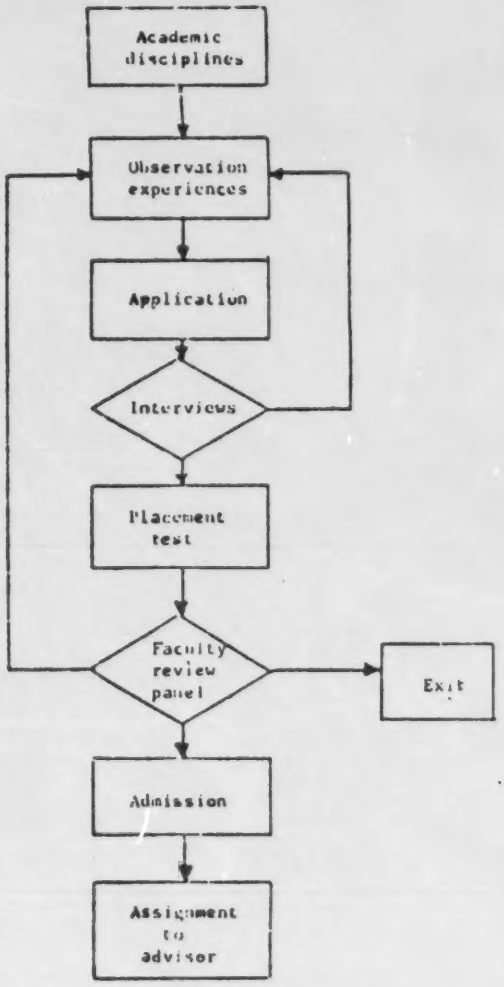



Figure 6

ADMISSION AND EXIT PROCEDURES FOR PROFESSIONAL EDUCATION

PROFESSIONAL PRESERVICE COMPONENT

The guidance component facilitates personal involvement and personal-professional self-development [See Figure 7]. the trainee becomes a partner in determing personal movement through the program. Faculty members in designated roles, foster the processes of growth, awareness, and self-development. Teacher trainees are helped to develop attitudes and skills necessary for assuming responsibility for their own learning and thus helped through program process to achieve skills necessary for the designated teacher competencies in the classroom which were previously described. This cooperative planning for learning is a unique feature of this program.

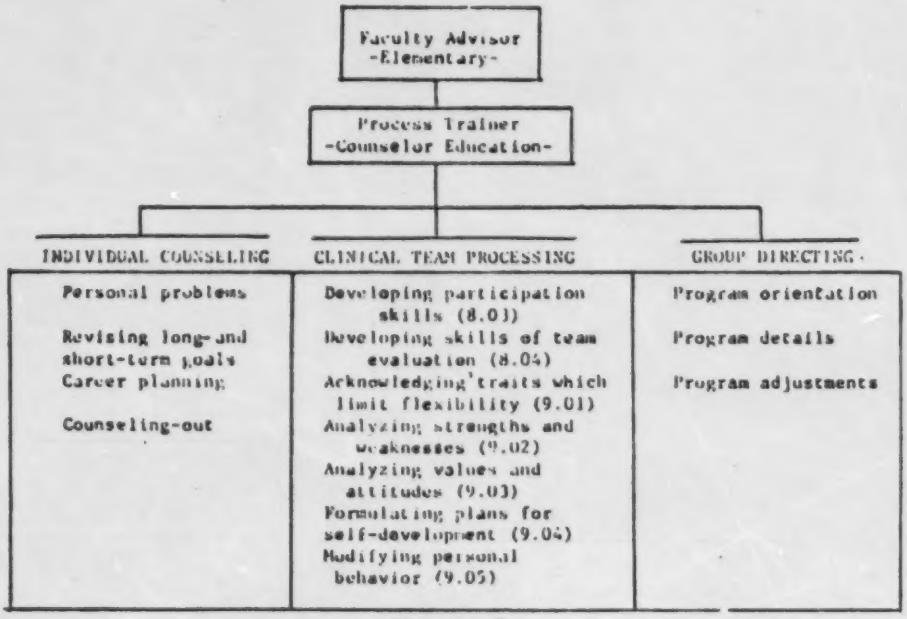
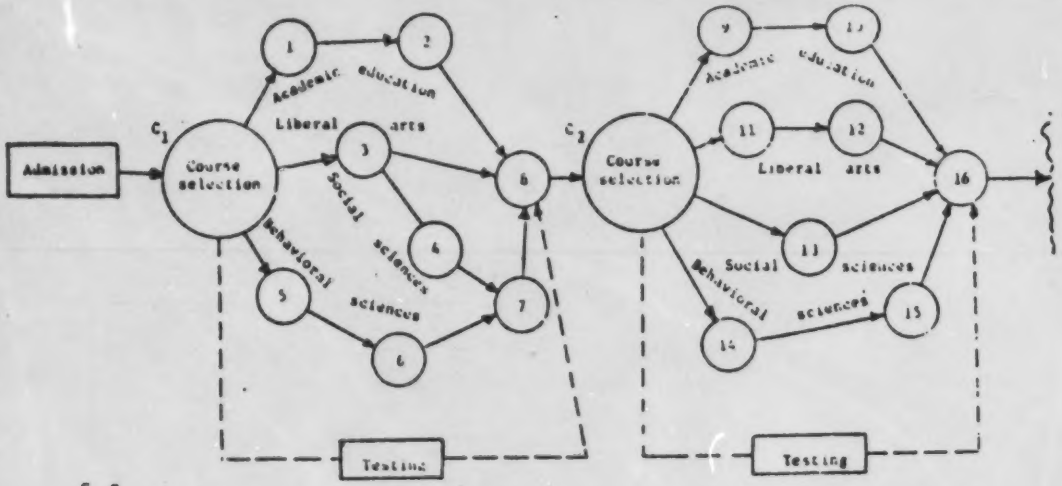



Figure 7

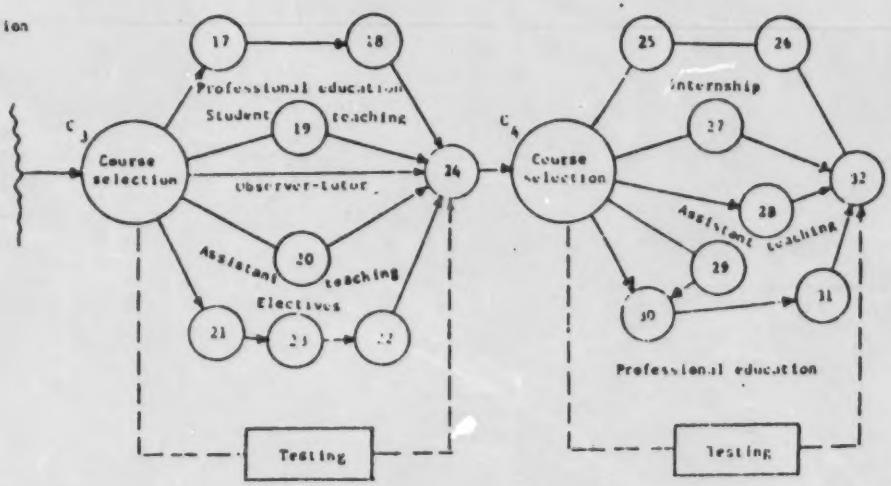
GUIDANCE PROCEDURES

Course Selection (Unit Experiences)

Each trainee selects units at four different stages according to an ordered subset of learning units. Selction is on the basis of objectives, previous performance, available facilities, school requirements, and the individual. [See Figure 8 for a hypothetical trainee unit plan.]




$C_1, C_2$: Academic learning sequences--tutorial, courses.
1, 2, through 32: Competency experience units needed for B. A. in education




$C_3, C_4$: Clinical learning sequences--tutorial, clinical.
1, 2, through 32: Competency experience units needed for B. A. in education

Figure 8

INDIVIDUALIZED INSTRUCTION:

TOTAL SEQUENTIAL MOVEMENT OF TRAINEE THROUGH PROGRAM (HYPOTHETICAL PLAN)

-55a-

Breakdown of Program Sequence

Academic sequence, first activity series, provides a resource of continual content in liberal arts, behavioral sciences, and social sciences. The trainee selects learning units in academic disciplines as a result of personal assessment and placement tests and/or needs discovered by content tasks.

Clinical sequence, second activity series, provides observation and participation in activities of the clinical setting. The amount of time depends upon individual needs and skill. At the end of this sequence, the trainee applies for a student teaching experience.

Clinical sequence, third activity series, allows the trainee to serve a dual roles as a part-time assistant teacher and a part-time student teacher. Assistant teaching provides clerical, teacher-aide, and tutoring experience. Student teaching provides practice working with pupils to develop mastery of teaching competencies. The trainee functions in a team situation supervised by clinical faculty members.

Clinical sequence, fourth activity series, allows continued pupil contact and team membership where each team role or function is analyzed. The trainee should exhibit a high level of mastery of teaching competencies, suggesting the ability for some participation in a leadership role on the team. This is an internship-level experience which provides opportunity for curriculum decisions, parent communication, and it continues until specified terminal degrees of mastery are achieved. Units in liberal arts and professional education continue until the trainee has mastered all 32 units.

INDIVIDUALIZED INSTRUCTION: UNIT EXPERIENCES

Unit experiences [See Figure 9] are structured to allow the trainee to meet the following criteria specified for individualized instruction; 1) the trainee can proceed at his or her own rate; 2) the trainee can make regular progress toward mastery of competencies; 3) units of instruction are determined by specified competencies; 4) learning is wholly or partially self-directed; 5) the trainee plays a major role in evaluation of progress; 6) materials, instructional techniques, and classroom settings are available to provide for adaptation to individual needs; 7) the trainee learns through active involvement in units of study, pupil-contact, and use of audiovisual media for peer- and self-analysis.

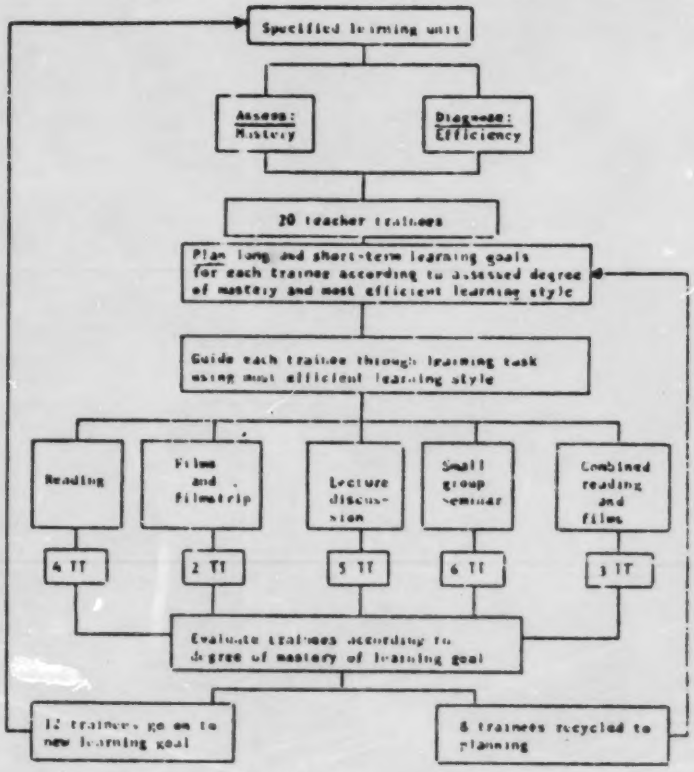

Specified learning unit
Assess: Mastery
Diagnose: Efficiency
20 teacher trainees
Plan long and short-term learning goals for each trainee according to assessed degree of mastery and most efficient learning style
Guide each trainee through learning task using most efficient learning style
Reading
Films and Filmstrip
Lecture discussion
Small group seminar
Combined reading and films
4 TT
2 TT
5 TT
6 TT
3 TT
Evaluate trainees according to degree of mastery of learning goal
12 trainees go on to new learning goal
8 trainees recycled to planning

Figure 9

INDIVIDUALIZED INSTRUCTION COMPETENCY--UNIT EXPERIENCE

## RELATIONSHIP OF THE PROFESSIONAL TO THE ACADEMIC COMPONENT

Both components are designed to promote self-development, flexibility, mastery, and efficiency through individualized instruction. Academic and professional elements enhance and support each other and are achieved by the student at parallel times. Content from the academic component provides modes of inquiry and investigation which can be applied to teaching as well as the cognitive input necessary to implement classroom learning. [See Figure 10 for relationship of program elements to self-development; see Figure 11 for interdisciplinary relationship of the components; see Table 2 for nature of contributions from each component to individualization.]

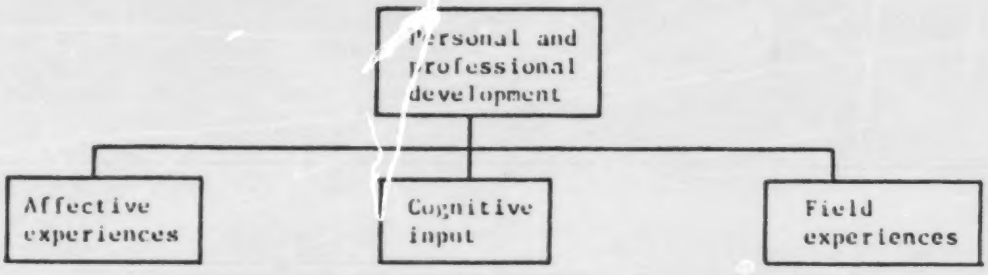



Figure 10

GENERAL TRAINING PLAN FOR SELF-DEVELOPMENT

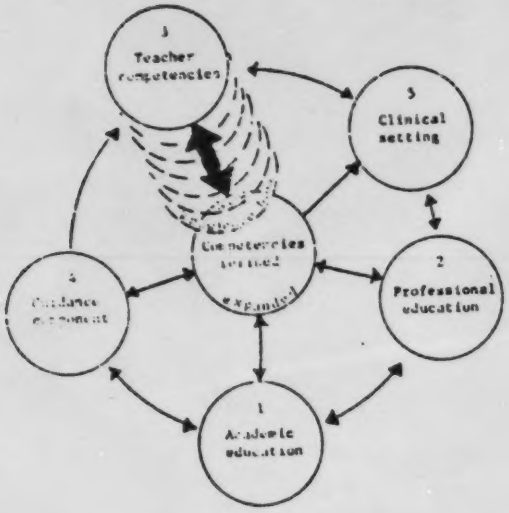



Figure 11

THE INTERRELATIONSHIP OF MAJOR COMPONENTS: EXPANDING THE KNOWLEDGE BASE OF THE MODEL

| Contribution | Component | Definition |
|---|---|---|
| Cognitive Input | Academic knowledge | Cultural background, liberal arts, behavioral sciences, school in society |
| Cognitive Input | Professional knowledge | Specifying goals, assessing achievement, diagnosing learners, controlling behavior, self-development, teamwork |
| Affective Experiences | Guidance | Self-development, teamwork |
| Field Experience | Clinical Setting | Application of cognitive input and affective experience, refinement of educational skills, study of learning process |

TABLE 2

NATURE OF THE CONTRIBUTION OF EACH COMPONENT TO INDIVIDUALIZATION

Liberal education is required for teacher trainees because it is a humanizing influence, it offers conceptualization opportunities through the liberal arts, and it provides modes of inquiry and processes of learning through disciplines.

Individualization in liberal arts provides maximal conceptual meaning and a personal resource for use by the future teacher. The program has the follow-

ing liberal arts requirements: 1) familiarity with subareas of knowledge and scheme of classification within the field; 2) command of key concepts in the field; 3) knowledge of history and development of the field; 4) knowledge of modes of inquiry for gaining and applying knowledge in the field; 5) knowledge of modes of investigating recorded knowledge in the field; 6) knowledge of interdisciplinary relationships; 7) knowledge of relevant materials.

INSERVICE COMPONENT

This program requires new types of clinical settings which are established through coalitions of colleges, schools, teacher organizations, and government agencies and which provide a required link between pre- and inservice education. Clinical settings must reflect the newest, most explicit behavior models and techniques required to promote new levels of teacher performance. They must serve children, teacher preparation, and research. There must be evidence of members' compatibility, agreement on roles and responsibilities, teacher agreement to develop the clinical setting, a specified manner to provide community information on the project, periodic assessment of the operation by coalition members, and communication techniques to provide free-flow information about the program operation.

FACULTY-STAFF REQUIREMENTS AND UTILIZATION

Faculty must use modes of instruction compatible with individualization. Six processes are specified [See Figure 12]: 1) specifying goals in terms of outcomes; 2) assessing student achievement in terms of outcomes; 3) diagnosing learner characteristics necessary for creating efficient means of task mastery; 4) planning short- and long-range learning programs with students; 5) guiding students with learning tasks; 6) evaluating the learner and determining new outcomes.

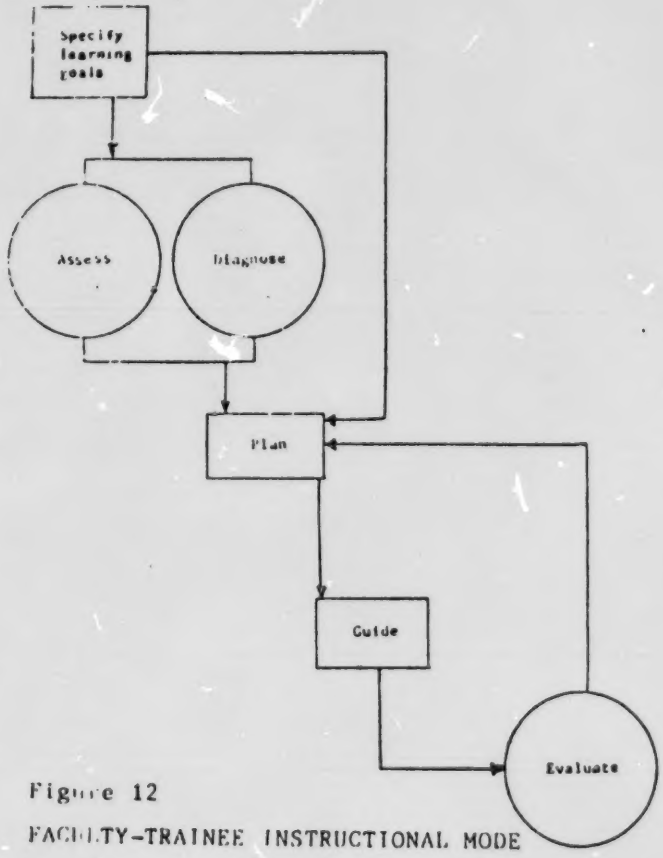



Figure 12
FACULTY-TRAINEE INSTRUCTIONAL MODE

Developing the professional knowledge base for teaching requires the profession to: 1)identify its knowledge base, 2) collect data about its techniques and materials, 3) analyze and evaluate its practices, 4) systematize procedures for extending a body of principles, strategies, and understandings. Through the liberal arts component, the student acquires a framework and modes of inquiry for extending his/her professional knowledge base (See Figure 13). The clinical experience provides a context for applying this knowledge base to the problems and issues arising from instructional decision-making. A clinical team consisting of educator, researcher, teacher, and academician assists the student in studying and receiving feedback about instructional decisions. Decisions are applied, tested, and evaluated in a cyclical process which provides a base for a professional methodology.

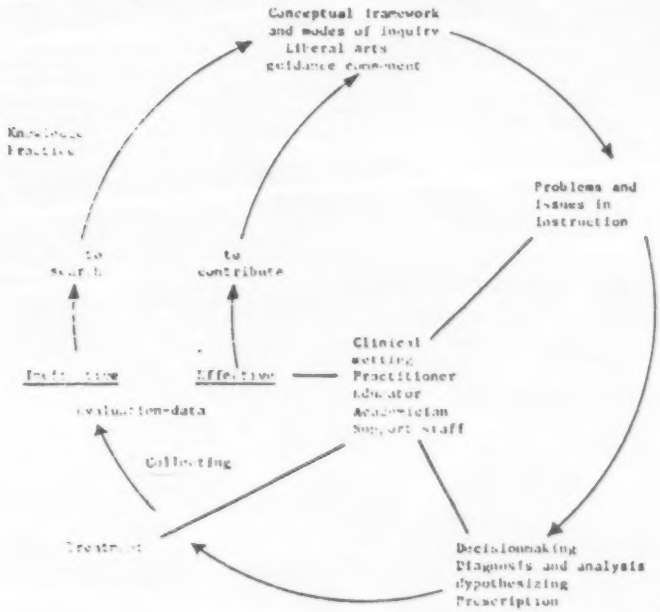



Figure 13

EXTENDING THE KNOWLEDGE BASE FOR TEACHING

The liberal arts program should be restructured early in development and requires that: 1) the school of education and academic departments recognize the need for program regeneration, 2) individualization is recognized and agreed upon as a program base, 3) sufficient budget, time, and personnel be allotted for development of instructional units, 4) a means of evaluation and feedback be established, 5) the relationship of each academic discipline to the total program be recognized early in the process, 5) the restructuring process be submitted to continuous examination as a base for institutional reorganization.

EVALUATION COMPONENT

The program is evaluated to provide information for guidance and improvement of the program and to give a comprehensive assessment of the total program. Evaluation data must answer the following questions: 1) Are competencies clearly stated in terms of outcomes? 2) Does the list of competencies exhaust all future possibilities? 3) Are there provisions for alternate routes to mastery? 4) Is individualization as a model for transfer to classroom teaching incorporated into the program? 5) What environments are available to meet individual needs? 6) Is the plan sufficiently developed to be implemented? 7) Is the plan appropriate to trainee characteristics? 8) Does the program account for variation of events which might require program modification? 9) Is the program consistent with theory from education and from the disicplines?

The decision to implement the program was made by answering the following questions: 1) Are behavioral objectives clearly stated? 2) Is there evidence that objectives are in the appropriate order? 3) Is there evidence that objectives are grouped into properly sized units? 4) Are objectives and units structured without any gaps? 5) Is there evidence of reliability and validity if diagnostic tests used? 6) How do precedures work for giving and scoring tests? 7) Is there evidence that tests provide information which trainees can use to monitor their own work? 8) Are materials appropriate and easily accessible? 9) To what degree does individualization take place? 10) What type of staff training is necessary to implement the program?

Evaluation of program outcomes in terms of trainee performance will require data to show: 1) measures of classroom performance of the identified roles of the future teacher; 2) data to show variations in materials and instructional routes; 3) data to show variation in instructional rates; 4) follow-up studies on trainees after graduation. This data combined with all other information available should provide the basis for program regeneration (See Figure 14).

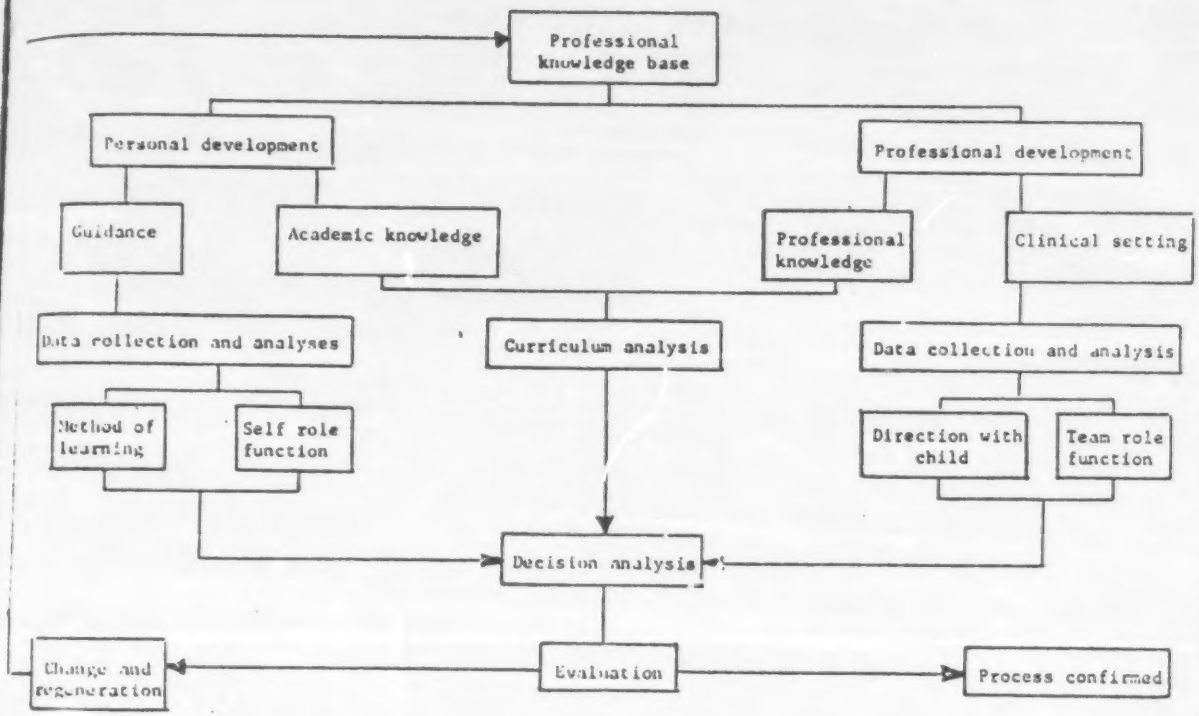



Figure 14

PROGRAM REGENERATION SYSTEM

PROGRAM MANAGEMENT

Program management requires the following functions: 1) planning and development, 2) financing, 3) operation maintenance, 4) information, 5) communication, 6) evaluation, 7) reformation of the program.

STEPS TO IMPLEMENTING A NEW PROGRAM

1) Select a model. 2) Assess faculty, students, and facilities with regard to program requirements. 3) Determine the capabilities of all resources. 4) Make specifications for broad, long-range program goals which are consistent with resources. 5) Identify immediate short-term goals with regard to facilities, materials, management, and faculty. 6) Acquire new resources which are needed for immediate goals. 7) Orient the faculty, evaluate and redesign courses, identify the clinical settings. 8) Recruit students. 9) Assess faculty, facility and material resources, and student capabilities. 10. Admit students on the basis of program design and student capabilities.

Teachers College, Columbia University

## THE TEACHER-INNOVATOR: A PROGRAM TO PREPARE TEACHERS

The development of a performance model is difficult because teaching is a highly complex act, there are conflicting ideas about what constitutes good teaching (science or art), and traditional teaching does not provide a sound basis for task analysis. However, there are bases which can be used as acceptable foundations for building such a model program.

First, technology: Many aspects of the traditional student teaching experience can now be conducted under simulation, thus providing a new base for redesign of the entire program. Educational technology can be applied throughout the program. Second, theoretical: 1) applied learnings from cybernetic psychology, 2) therapeutic models (Rogers, for example) can be applied, 3) developmental (cognitive and personality) theories can be applied, 4) theories of learning generated from analyses of society and the disciplines, 5) theories of curriculum and instruction based on the relationship between educational environments and learning outcomes are also applicable.

In the absence of definite solutions and with the availability of alternative theories, methods of research and experimentation can be used. The teacher becomes an experimenter--the teacher-innovator.

### Developing the Performance Model

First, develop a broad performance model, then develop a structure of teaching which enables the goals and the process of teaching. In the absence of evidence, the selection of competencies becomes a matter of judgment and begins with identifying the several domains in which a teacher operates.

The rationale for this type of model: Professional performance should be described in terms of control over certain areas of reality essential to the development of creative roles, rather than the ability to fill already existing roles.

Identification of the areas of reality that the professional must control in order to define and solve educational problems makes the professional function that of creative manager and puts future growth in a central position. Curricular systems to enable professional mastery of essential areas are set up.

THE TEACHER-INNOVATOR: FOUR ROLES—FOUR PROGRAM COMPONENTS

The teacher-innovator is the creative manager of the future, functioning in four areas of reality (roles) which are the core components of the program. Program process and content are designed to enable candidates to master knowledge, attitudes, and skills leading to mastery of requirements for role fulfillment. The four roles identified are institution-builder, interactive teacher, innovator, and scholar.

Institution-Builder (Shaper of Schools). The teacher-innovator cooperates with other faculty, community representatives, students, and administrators to design educational programs and organizational structures. In contrast to traditional programs which place great emphasis on contact with children, this program places great emphasis on the teacher as curriculum developer, technological systems organizer, and social systems designer. The teacher of the future must function creatively in areas of reality. The teacher's role as institution-builder is critical, for the character of the institution has as much impact on the child as does the child's contact with the teacher.

Behavioral objectives in this component are broad and do not represent levels of attainment.

First Objective. Knowledge of the major theoretical positions on the shaping of the schools. This includes knowledge of theory and research in educational innovation, major contemporary reformers, reasonable examples of historically important positions, and actual institution-building activities.

Second Objective. Knowledge of the procedures for developing organizations of community members, educators, and students to develop and implement educational patterns; familiarity with reports, case studies, and general position papers relative to organizational development.

Third Objective. Skill in organizing cooperative groups to develop educational components. This includes the ability to organize a committee and carry it through the planning stages so that an educational component is actually organized. It is the operational aspect of the second objective.

Fourth Objective. Knowledge of the various purposes of the school which have been suggested in theoretical literature or actually developed. This

includes understanding such theoretical positions as psychoanalytical and academic; acquaintance with conceptual systems for studying the learner; evaluating learners' intellectual, social, emotional development; knowledge of learning theory; and strategies for curriculum development.

Fifth Objective. Knowledge of strategies for individualizing education to meet the needs of learner and community. It includes the ability to analyze such needs.

Sixth Objective. Knowledge of alternative ways of organizing technological support systems. This involves knowledge of technical assistance to human behavior, library and media utilization and design, and support systems theory.

Seventh Objective. Knowledge of theory and research that pertains to the development of social systems of the school and an applied strategy for building such a system. The candidate must also possess tools of social systems analysis and work with children in applied situations.

The component is made operational through six program phases:

Phase I occurs in simulation. The simulation consists of information about three communities and a group of 14 students who comprise the learner population of each community. Candidates accomplish various curriculum tasks on the basis of the information provided.

Phase II provides conceptual knowledge of nine approaches to curricular and instructional strategies and the skills for carrying them out in the classroom. A seminar deals with the organization of curriculum modes. Candidates also study the use of support systems.

Phase III is the study of strategies in the curriculum. Each candidate must develop competence in curricular and instructional strategies of one curriculum area. Acquaintance with major systems of instruction, necessary instructional materials, and support systems is required.

Phase IV deals with experimental units. An inquiry group develops and implements a unit in an area of members' specialization. It includes a complete curriculum plan, support system, and experimental design.

Phase V allows the group to carry out a specific phase of activities in a remedial-enrichment school.

Phase VI apprentices feedback teams to a school as a center of inquiry. The team studies institution-building activities and problems of shaping schools.

The Interactive Teacher. Contact with children requires strategies for making instructional decisions tailored to meet the needs of children. As a student of individual differences with interpersonal sensitivities, the teacher develops contacts with children and modifies personal teaching behavior. There are four subcomponents of this component: 1) institutional decision-making, 2) teaching strategies, 3) flexibility training, 4) teacher as shaper of clasroom social systems.

The following is a complete description of the teaching strategies component which requires candidates to master four basic teaching maneuvers and nine basic teaching strategies. Maneuvers of teaching are methods of controlling professional behavior to induce student behavior that will lead to positive outcomes. The four promoted are maneuvers to productive inductive thinking, induce mastery of content, induce self-direction, and structure activity.

The nine strategies are based on nine models of teaching: 1) inductive thinking model taken from the work of Hilda Taba; 2) inductive concept attainment model based on work of Jerome Bruner and associates; 3) inquiry training model based on work of Richard Schumann; 4) cooperative inquiry model based on work of Herbert Thelen; 5) nondirective model developed from work of Carl Rogers and aimed at helping students teach themselves; 6) differential training model based on work of David E. Hunt on adaptation according to personality; 7) a strategy derived from process analysis; 8) a programmed model based on work of B. F. Skinner and followers; 9) an integrated personality model based on the work of Abraham Maslow.

There are four levels of behavioral objectives for the strategies subcomponent:

LEVEL I: Objective 1. Teacher discriminates four basic maneuvers.
Objective 2. Teacher can demonstrate an example of each of the maneuvers—create a lesson plan for each and execute each plan so that each maneuver is observable.

LEVEL II: Objective 3. Teacher can identify nine models and basic theories.
Objective 4. Teacher can build and execute lessons using each of the nine strategies.

LEVEL III: Objective 5. In at least one curricular area, the teacher can identify a repertoire of strategies and execute them while working with children.
Objective 6. Teacher can carry out teaching strategies that utilize contemporary support systems.

LEVEL IV: Objective 7. Teacher develops and tests a personal strategy or an original version of one already learned.

The operation of this subcomponent is based upon the following paradigm: The teacher learns to discriminate behaviors, learns to produce them, obtains feedback from peers via recorded episodes, and with coaching, repeatedly practices the behaviors until they are mastered.

Innovator. Combining personal creativity, the ability to cooperate, and techniques of social analysis, the teacher builds educational settings in which innovation, rather then imitation, is the norm. Reference group theory is used to motivate students with commitment to innovation. Then students are helped to understand problems in coping with bureaucracy which will help them to generate different kinds of organizational structures.

Scholar. Continuous scholarship renews and extends the teacher's knowledge of education. A specialization in one discipline provides knowledge of the discipline's modes of inquiry and research that relates the discipline to the needs of children. The scholar masters the range of teaching strategies and techniques necessary for developing and testing new ones.

FOUR GENERAL METHODS OF PROGRAM OPERATION

Inquiry groups of about 12 students administer the program to themselves with faculty serving as counselors, technical advisors, and dialog leaders. Members of inquiry groups are organized into feedback groups of three or four members. These groups work together, ideally throughout the entire program, learning skills, analyzing teaching behavior, and carrying out experiments. Each group elects members to a steering committee of faculty, administrators, and students. The steering committe adminsters, evaluates, and revises the program components.

The methods of cooperative inquiry upon which inquiry groups are based accomplish three things: 1) operation of a democratic program, transferrable to the classroom; 2) involvement of candidates in a peer-supported, continuously experimental activity; 3) involvement of candidates in shaping their own educational future.

A differential (individualized) training model prescribes different educational environments on an individualized-needs basis and is aimed at

increasing learning and increasing personal flexibility. The educational procedure takes into account the individual competency level, feedback preference, and cognitive structure of the candidate.

An inquiry school laboratory program provides opportunity for candidates to carry out lengthy experiments. The school is exemplary in terms of program and in terms of the method of educational process employed.

The contact laboratory where students have direct contact with children and public schools provides an initial apprenticeship in a traditional situation. Thereafter the contact laboratory does not use any traditional student teaching experiences. At the internship level, three candidates assume the regular responsibilities of two teachers. (Figure 15 shows the relationship between these four general structural elements of program operation and the four basic program components.

| | | General elements | | | |
|---|---|---|---|---|---|
| | | Inquiry groups (democratic method) | Differential training model (faculty administered) | Inquiry school (laboratory school) | Contact l... (direct experien... with chil...ren) |
| Four basic components | Institution-builder | | | | |
| | Interactive teacher | | | | |
| | Innovator | | | | |
| | Teacher-scholar | | | | |

Figure 15

RELATIONSHIP BETWEEN GENERAL STRUCTURAL ELEMENTS AND FOUR BASIC COMPONENTS

SIX PHASES OF THE CONTACT LABORATORY

The contact laboratory begins in the first weeks of the program and continues into the first year of paid teaching. (See Table 3.)

Phase I: Experiencing the School is a four- to eight-week apprenticeship as an unpaid teacher aide in a classroom. Members of inquiry groups are placed in the same school and work in twos and threes with an individual class or on a team. It serves two purposes: contact with children, schools, and teachers; opportunity to analyze the school as an institution.

Phase II: Tutorial and Small-Group Teaching is preferrably a candidate-operated program which lasts 10 to 20 weeks and provides experience with one to five children for short periods several times a week. Possible structures are after-school or weekend remedial or enrichment group, tutoring a small group or teaching in a school, participation in after-hours or weekend program at the inquiry school, participation in a community (storefront) school. Practice is provided in the study of teaching strategies, application of previously learned methods, development and testing of previously learned strategies. It serves the innovator component by providing opportunity for experimentation, analysis, and creative teaching. It serves the scholar component by providing practice in techniques for studying, learning, and conducting research in the disciplines.

Phase III: Unit Experimentation. Each inquiry group tailors a four- to six-week learning unit to a group of children and carries it out. This phase serves all four components.

Phase IV: Experience in the Curriculum Modes--Inquiry School. Candidates study several approaches to education at the inquiry school. Students may serve as aides. This phase serves all four components. The difficulty of providing this phase lies in the necessity of first establishing the school which a model school designed for operation of the program.

Phase V: Operating An Educational Program. If a candidate has already participated in a remedial-enrichment program, this phase is not necessary. Otherwise, the candidate operates a remedial-enrichment program during summer school or on weekends.

Phase VI: Internship. This is the first year of teaching. Three candidates assume the responsibilities of two teachers as part of a team or as a team. (See Table 3 and Table 4 for a description of how the phases of the contact laboratory relate to the four program components.)

| Contact laboratory-phase | Subcomponents of interactive teaching component: Instructional decisionmaking | Teaching strategies | Flexibility training | Structuring the classroom |
|---|---|---|---|---|
| I Experiencing the school | "The Teaching Game" | | Study "coping" behavior | Study microethnography of classroom |
| II Tutorial-small group teaching | Tasks in the simulated school | Study and master maneuvers | Communication tasks | Master structuring maneuvers |
| | Study specialty related strategies | Study and master strategies | Practice in tutorial | Experiment with teaching strategies |
| | Practice in tutorial situations | Create and test strategies | Situations | Diagnose and apply |
| III Unit experiment | Apply to unit | Apply to unit | Apply to unit | Apply to unit |
| IV Inquiry school | Analyze strategies of inquiry teams | Analyze strategies of inquiry teams | Analyze teachers | Analyze structuring in inquiry teams |
| V Operating remedial-enrichment school | Apply strategies | Apply and test strategies | Apply and test self (continue training as appropriate) | Apply and test self (continue training as appropriate) |
| VI Internship | Apply strategies | Create and test strategies | Apply and test self (continue training as appropriate) | Apply and test self (continue training as appropriate) |

Table 3

PHASES OF COMPONENTS BY PHASES OF CONTACT LABORATORY

THE INTERACTIVE TEACHER COMPONENT

| Contact laboratory-phase | Components: Institution-builder | Innovator | Teacher-scholar: Study of teaching | Study of learner |
|---|---|---|---|---|
| I | Analyze social, technical, and curricular systems of school | Experience and analyze bureaucratic structure | | |
| II | Tasks in simulated school | Analyze bureaucratic as nonbureaucratic behavior | Study four conceptual systems | Study developmental theories |
| | Study curricular specialty-alternative curricular systems | Develop experiments in reference group | Study own teaching | Apply to students |
| III | Develop and test unit | Develop experiments in reference group | Study own teaching | Apply to students |
| IV | Study strategies of inquiry school | Reference group establishes ties to inquiry school faculty | | Study in inquiry school |
| V | Plan and carry out remedial-enrichment school | Reference group plans and carries out remedial-enrichment school | | Carry out experiments in R-E school |
| VI | Apply strategies in teams | Reference group members placed in teams | | With team members, continue study |

Table 4

PHASES OF COMPONENTS BY PHASES OF CONTACT LABORATORY

INSTITUTION-BUILDER, INNOVATOR, SCHOLAR COMPONENTS

Provision for Feedback and Differential (Individualized) Training

Feedback is fairly automatic because of the nature of the learning activities. Faculty members are extremely active during the last two phases of the contact laboratory, particularly in planning. Research consultants are available to help students develop systems for testing original teaching hypothesis.

The differential model is fairly easy to administer. In the first phases, learner tasks can be closely matched to achievement. In the latter phases, faculty members must rely on judgment and students must take greater responsibility if more personalized structure is needed.

Relationship of the Professional Program to Programs of General Education

The program makes no specifications but assumes that the teacher candidate should explore at least one subject area in great depth and much of the content in general education should involve the candidate in the study of human issues.

Northwest Regional Educational Laboratory

## A COMPETENCY-BASED, FIELD-CENTERED APPROACH TO ELEMENTARY TEACHER EDUCATION (COMFIELD)

### GENERAL PROGRAM DESCRIPTION

The broad program goal is to prepare teachers to perform the various functions required by schools of the future. The program provides specifications for such a program through a systematically designed, personalized, competency-field-based model built upon the assumption that the prospective teacher should be able to demonstrate at the preservice level those competencies required for inservice certification.

The program is based upon several assumptions: 1) Functions performed by teachers in given settings must be specified; 2) The outcomes of the functions that are acceptable evidence of proficiency must be specified; 3) The teacher education program does lead to the teacher's ability to perform the functions and outcomes specified; 4) Prior to certification, candidates should be able to demonstrate that they are independent, self-directed, and adaptable to new behavior patterns; 5) A teacher education program must have personal relevance for participants through such accomodations for individual differences as learning rates, styles, and objectives; 6) A teacher education program must be responsive to the needs of a changing society; 7) If the primary teacher function is the facilitation of human development, the program must be quite clear about the outcomes, the conditions required to promote them, and the nature of the teacher competencies which will achieve the above.

#### The Adaptive Process

The program is designed to bring about specified measureable outcomes, provide continuous feedback on its own effectiveness, and be adaptive and corrective. As such, it represents a way of proceeding. (See Figure 16.)

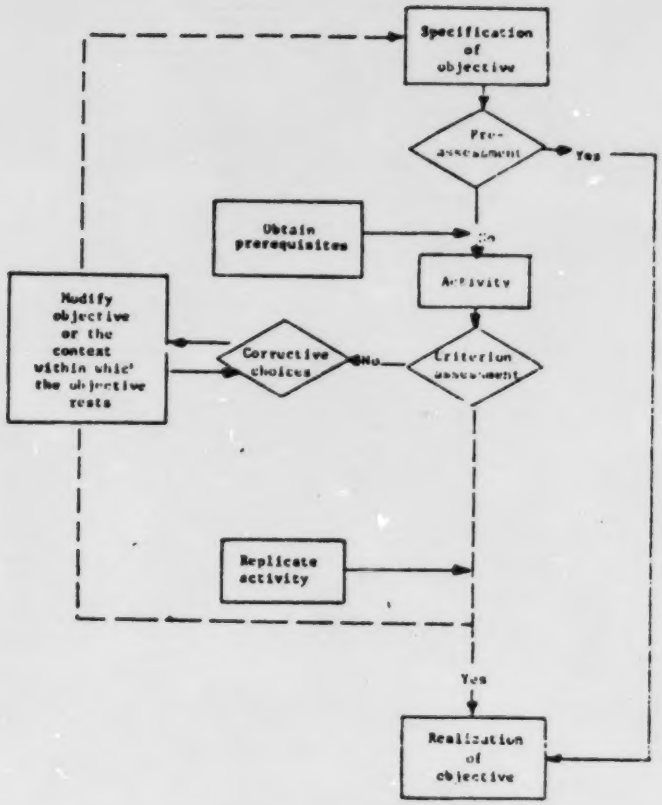



Figure 16
THE ADAPTIVE PROCESS REFLECTED THROUGHOUT THE COMFIELD MODEL

## SPECIFICATIONS FOR APPLICATION OF THE MODEL TO SPECIFIC SETTINGS

Development of Program Objectives. To translate the broad program goal into operational program objectives, it is necessary to specifiy the condition of future education, the functions to be performed in that context, and the tasks to be performed within each function to enable its execution.

Because the specification of functions and tasks is critical, the model requires that a state-level organization, such as an educational objectives commission, be established and that all decisions about outcomes be weighed against knowledge about human development and behavior, present social and cultural conditions, and the nature of future social and cultural conditions.

Developing a Way to Assess Program Objectives. Three steps are necessary for the assessment of student competence in task performance: 1) Identify behaviors or products of behaviors in children; 2) Identify procedures which promote reliable observation of number (1); 3) Develop the measures identified in number (2) to the point of reliability.

There are four interacting variables in definitions of teacher competency

1) desired outcomes, 2) pupil characteristics which interact with instructional conditions to cause outcomes, 3) characteristics of instructional settings which interact with both pupil characteristics and instructional conditions to cause outcomes, 4) the nature of the instructional act per se. This requires that competence be assessed in settings which provide sample classes of outcomes for sample classes of population within sample classes of educational settings.

Developing Learning Experiences Which Lead to Program Objectives

After tasks, behaviors, and outcomes have been specified, systematic development requires: 1) identification of the conditions necessary to bring about successful performance; 2) specification of the knowledge, skills, and sensitivities required to provide the conditions in number (1); 3) specification of conditions through which these knowledges, skills, and sensitivities can be developed. (See Figure 17.)

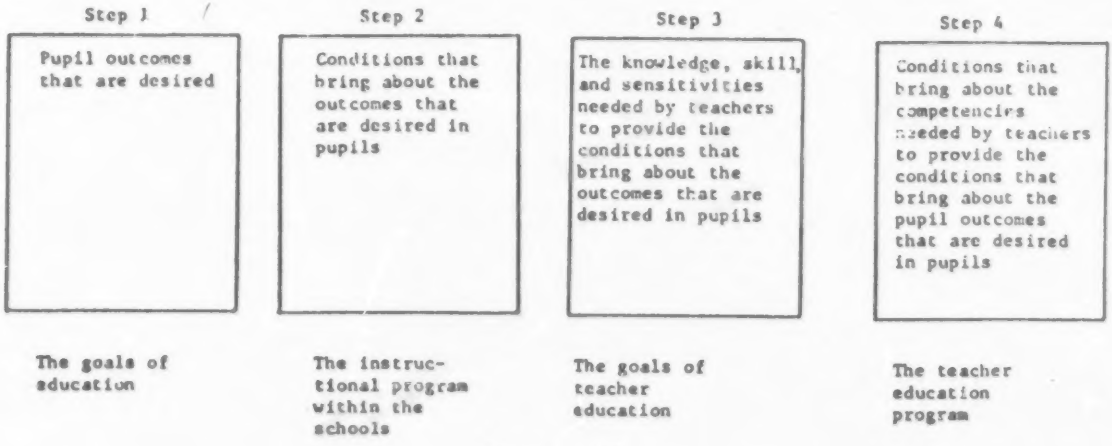

Step 1
Pupil outcomes that are desired
Step 2
Conditions that bring about the outcomes that are desired in pupils
Step 3
The knowledge, skill, and sensitivities needed by teachers to provide the conditions that bring about the outcomes that are desired in pupils
Step 4
Conditions that bring about the competencies needed by teachers to provide the conditions that bring about the pupil outcomes that are desired in pupils
The goals of education
The instructional program within the schools
The goals of teacher education
The teacher education program

Figure 17

SEQUENCE OF STEPS IN THE SYSTEMATIC DESIGN OF A COMFIELD-BASED PROGRAM

Designing Instructional Experiences Which Lead to Certification Outcomes

Instructional design should utilize instructional systems methodology as defined by: 1) an empirically developed set of learning experiences designed to bring about a given outcome for given learner(s) with reliability; 2) the systematic analysis of what is to be learned and a systematic way of structuring it from the learner's point of view; 3) a specified set of learning

experiences which have high probability of producing a system of mastery in the learner. All specified instructional strategies and outcomes should have optimum potential for producing the specified outcomes.

The development process is cyclical and empirical. Instructional materials are prepared, tested for effectiveness, and modified individually or collectively until they produce the desired outcomes.

Development of Personalizing Strategies

Individualization is provided through systems of multiple entry points, critical paths along which students may move, multiple media forms, and allowances for individual rates of progress. Individualization also requires opportunities for students to: 1) contribute to program design and development; 2) negotiate their own outcomes; 3) negotiate individual settings for competency demonstration and negotiate competency criteria; 4) continuously assess relevancy of objectives and the course of educational experiences leading to them; 5) develop a minimal level of self-understanding as a base for making judgments; 6) develop an integrated personal teaching style.

Development of Positive Field Relationships

The requirement for competency demonstration in the field requires public school personnel to become full partners in the teacher education program. This requires participation in all decisions affecting the program's operation and also participation in the instructional program per se.

The requirements for laboratory and simulation demonstrations assume that required tasks should be initially performed under conditions where complexities have been simplified and risks have been minimized before assuming responsibility for actual classroom learning. The major responsibility for these simulated and laboratory experiences lies with the university. Where demonstration of competency is required in the actual classroom, the major responsibility lies with school personnel.

For the partnership to work, methods must be established which permit equal participation of the partners in: 1) establishing competencies to be demonstrated under laboratory conditions, establishing behaviors or outcomes which are acceptable as evidence of those competencies, and confirming the demonstration of those competencies; 2) establishing competencies to be

demonstrated in the classroom, establishing behaviors or outcomes which are acceptable evidence of those competencies, and confirming the demonstration of those competencies under field conditions; 3) representation in all policy matters relating to the total program.

As a result of the partnership and the program requirements established from it, new roles will require college staff to become involved in new ways in the public schools and public school personnel to become active participants in areas formerly reservered to the college. This will require major operational changes in schools and universities, redistribution of resources, and a major inservice program to prepare staff for new roles.

Instructional Management System for Support Functions

COMFIELD requires eight support functions: 1) personnel selection and training; 2) maintenance of equipment, supplies, and facilities; 3) development of instructional systems used in the program and support of basic research necessary to support that function; 4) continuous evaluation of program effectiveness and appropriateness; 5) continual program adaptation based on systematic appraisal; 6) cost accounting; 7) program execution; 8) maintenance of an information management system. (See Figure 18.)

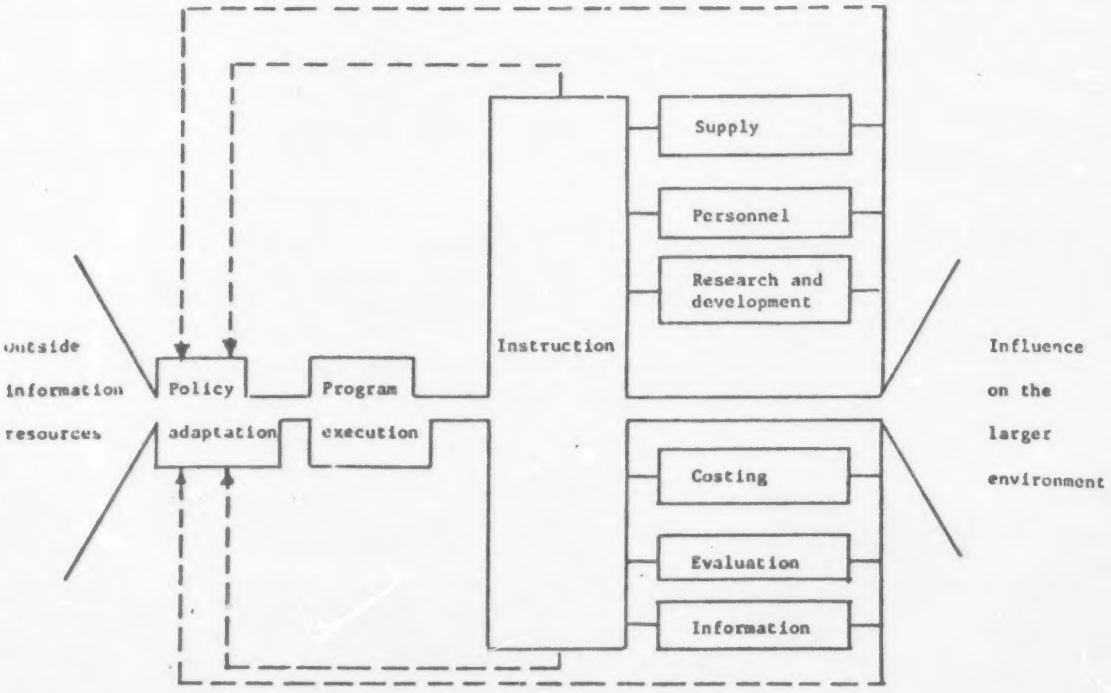



Figure 18

A SCHEMATIC DESIGN OF THE COMFIELD MANAGEMENT SYSTEM

The objectives of the management system are: 1) maintenance of the instructional program as top priority; 2) provision of maximum opportunity for information and directional influence to flow from instructional to support components and vice versa; 3) provision of continuous flow of information from the policy adaptation component to program execution component. These objectives are reflected by the organizational structure shown in Figure 18.

PROGRAM DESCRIPTION

Anyone admitted to the general college program is eligible for admission to the program. Success in the program, once admitted, depends upon the student's ability to perform the criteria specified for program exit. No time requirements are place upon program completion.

Preservice Component. The underlying task is to prepare students to be able to demonstrate the competencies of performance and desired learner outcomes under both laboratory and actual classroom conditions and to demonstrate competencies required for noninstructional tasks. Each student must also develop a recognizable and defensible style of teaching.

The component is based upon two kinds of content: 1) principles of instructional and noninstructional tasks; 2) knowledge, skills, and sensitivities prerequisite to those principles.

Four sets of competencies must be demonstrated: 1) content relevant to the development of competencies necessary to produce specified learner outcomes; 2) content relevant to the development of noninstructional tasks; 3) content relevant to the development of adaptive and interpersonal competencies that enhance (1) and (2); 4) content relevant to the development of competencies that permit personalization of (1), (2), and (3). [See Figure 19 on next page for summary of major blocks of content in the program.]

Relationship of the Professional to the Academic Component

An adopting institution must adapt its preservice component to the already existing requirements in general-liberal education. There are two additional specifications: 1) all students in the teacher education program must be involved in general-liberal education; 2) students in teacher education require knowledge of the disciplines in order to conduct classroom instruction. [See Figure 20, next page.]

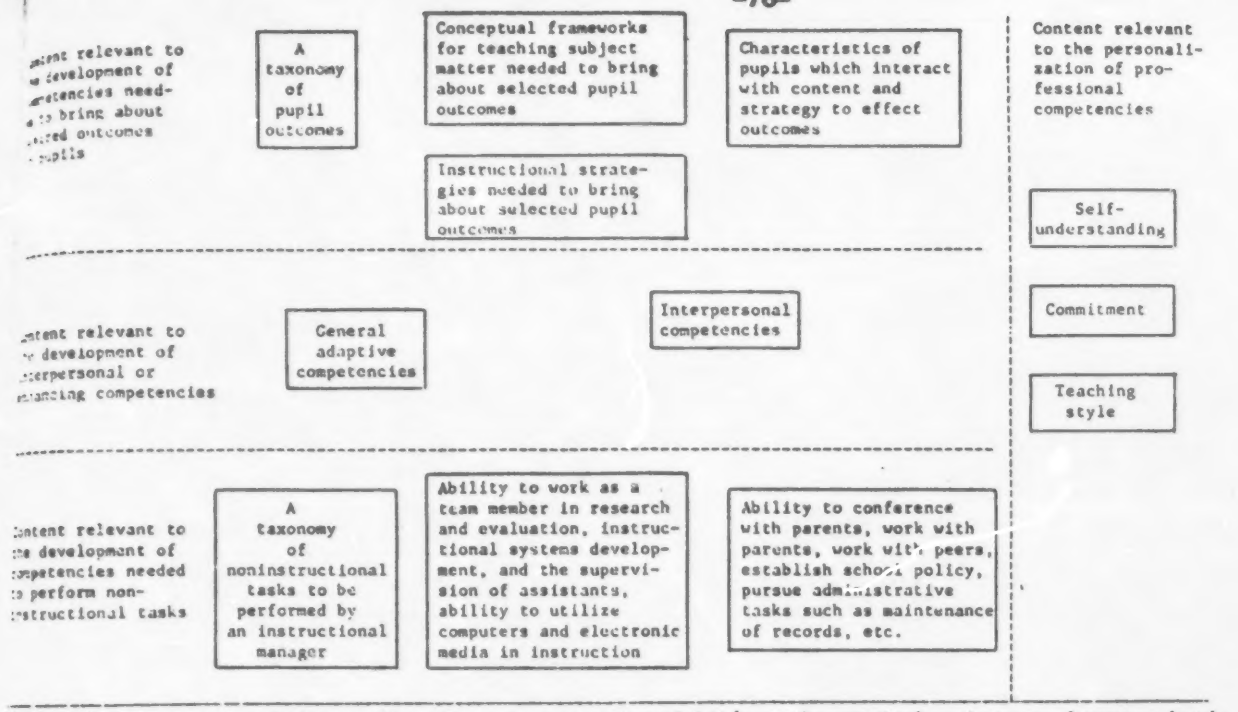

...ent relevant to ... development of ...retencies need... ...to bring about ...ired outcomes ...pupils
A taxonomy of pupil outcomes
Conceptual frameworks for teaching subject matter needed to bring about selected pupil outcomes
Characteristics of pupils which interact with content and strategy to effect outcomes
Instructional strategies needed to bring about selected pupil outcomes
Content relevant to the personalization of professional competencies
Self-understanding
Commitment
Teaching style
...ntent relevant to ... development of ...terpersonal or ...nancing competencies
General adaptive competencies
Interpersonal competencies
...ntent relevant to ... development of ...petencies needed ...o perform non-...structional tasks
A taxonomy of noninstructional tasks to be performed by an instructional manager
Ability to work as a team member in research and evaluation, instructional systems development, and the supervision of assistants, ability to utilize computers and electronic media in instruction
Ability to conference with parents, work with parents, work with peers, establish school policy, pursue administrative tasks such as maintenance of records, etc.
...blocks of content can be adapted equally well to the preparation of I.M 's at the preschool, primary or elementary levels.

Figure 19

THE MAJOR BLOCKS OF CONTENT WITHIN THE COMFIELD INSTRUCTIONAL PROGRAM

| GENERAL EDUCATION | PROFESSIONAL EDUCATION | | | | CAREER TEACHING |
|---|---|---|---|---|---|
| | Foundations-laboratory Phase | | | Practicum Phase | |
| Knowledge prerequisite for entry into instructional programs dealing with the conceptual frameworks underlying disciplines | Mastery of repertoires of knowledge that deal with the conceptual frameworks needed for teaching subject matter to young children | Mastery of repertoires of knowledge dealing with the elements and strategies of the teaching act | Demonstration of competencies which bring about desired learning outcomes in children | Demonstration of competencies which bring about desired learning outcomes in children<br><br>Demonstration of competencies which lead to the successful performance of non-instructional tasks | Knowledge prerequisite to successful performance as a supervising teacher in the practicum phase of Com-Field |
| | Mastery of repertoires of knowledge essential to the performance of general adaptive and interpersonal skills | | Demonstration of competence in the performance of general adaptive and interpersonal skills | Demonstration of competence in the performance of general adaptive and interpersonal skills | |
| | Mastery of repertoires of knowledge essential to the development of self-understanding, commitment, and a preferred teaching style | | Demonstration of behavior acceptable as evidence of self-understanding, commitment, and a preferred teaching style | Demonstration of behavior acceptable as evidence of self-understanding, commitment, and a preferred teaching style | |
| Prospective IM meets program entry requirements | | | Prospective IM meets performance requirements for exit from the foundations-laboratory phase | Prospective IM meets performance requirements for exit from the practicum phase | |

Figure 20

ORGANIZATION OF THE MAJOR BLOCKS OF CONTENT WITHIN THE COMFIELD PROGRAM

INSERVICE COMPONENT

The program has a set of guidelines for the preservice-inservice continuum based upon hierarchies of performance criteria. These meet two distinct, but related purposes: 1) diagnosing teacher needs and prescribing from a number of learning alternatives for remediation; 2) evaluating teacher competency and growth in order to determine initial placement and career advancement with a differentiated staffing structure.

Program priorities are set in a way which allows credentialing to become a formality and places the emphasis on growth as the criterion for all training experience. Therefore, the program emphasizes the interrelationship of preservice and inservice in a way that enables continuing professional growth.

EVALUATION COMPONENT

There are two distinct components of the evaluation system:

Control Subsystem. These evaluation activities offer feedback information on the efficiency of the system. Specific data necessary to problem-solving decisions demanded by individual circumstances with the program are offerred. These activities provide managerial data on facilities and staff as well as feedback on specific program components.

Analysis Subsystem. These activities offer external information on the appropriateness of the overall program. The activities are designed to provide information of the relationship of the program to its graduates who are teaching, thus yielding generalizable results and unit evaluation of the entire program. Market value, validity of performance criteria, and the degree to which the program maintains relevance and meets current needs are the concern of this subsystem.

PROGRAM MANAGEMENT

The Control Subsystem is the process controller responsible for maintaining the system in a stable state and operating in optimum manner. It carries on continual analysis and uses collected data for decision-making. Immediate feedback for system control is provided through aptitude measurement, guidance, scheduling, and attitude monitoring functions.

The Administrative Subsystem supplies materials, staff, and paraprofessionals necessary for program operation and management. It allocates funds for oper-

ational coordination of the program with the rest of the university and with other agencies.

The Information Subsystem is highly organized and contains data which include: 1) aptitude and achievement data stored in the control subsystem; 2) sequence of learning experiences selected by each trainee and some measurement of the effectiveness of the sequence in relation to the trainee's goals; 3) cost in terms of resources; 4) faculty-student time required to help each trainee meet performance criteria; 5) system status of each trainee; 6) utilization and availability of all training resources including staff, equipment, and facilities.

The Educator Subsystem has two components responsible for direct interaction with trainees. All instructional methods used by trainees are generated by this subsystem and range from formal lectures to microteaching. The system must respond to demands by trainees for changes in instructional alternatives.

The Analysis Subsystem provides feedback regarding the quality, success, competency, acceptability, and competiveness of the program's graduates. The feedback is used to delete and/or modify performance criteria. Analysis of trainee performance and indirectly the effectiveness of performance criteria is measured using rating procedures, video tapes, filed data, and market value of trainees. Comparative analyses are made of three groups: program graduates, graduates of other teacher education programs, and the population of experienced teachers.

## SYSTEMS ANALYSIS APPROACH

Systems analysis was determined to offer a basic set of understandings and tools with which effective approaches to the organization of the many diverse elements of the program could be determined. Such an organization gives coherence and structure to the implementation of performance criteria and has been used as a basic set of guidelines throughout the program.

University of Massachusetts

## MODEL ELEMENTARY TEACHER EDUCATION PROGRAM (METEP)

### OVERVIEW

Performance criteria stated in areas of subject-matter knowledge, behavioral skills, and human relations are guidelines to program design. Each stated criterion provides at least two instructional alternatives. The trainee completes the program when criteria are met, therefore there are multiple entry and exit points. A systems analysis approach is used to organize, manage, and evaluate the program. Other major concepts include differentiated staffing and commitment to graduates beyond graduation.

### RATIONALE AND GOALS

Change is institutionalized through an analysis of educational roles, structures, and objectives proceeding from seven assumptions: 1) The teacher's role is changing and will continue to change, therefore teachers must be prepared for change rather than imitation; 2) Specific performance criteria based on analysis of knowledge, skills, and attitudes in content, behavioral sciences, and human relations can provide a base for flexible change; 3) Differentiated roles in schools will require personnel with new and different areas of specialization and competency; 4) Since there is no one proven strategy in teacher education, many differing overall strategies may be used; 5) Continuous diagnosis of each trainee's needs and evaluation of program components designed to meet those needs must be a major goal; 6) As a result of (5), development of program alternatives is emphasized; 7) Since a teacher's training never ends, a closely knit relationship between preservice and inservice education must be developed.

### SELECTION PROCEDURES

Any university student is eligible to enroll. Tests are administered for research rather than admissions' purposes.

PROFESSIONAL PRESERVICE COMPONENT

It is the flexible teacher who will be most effective in schools of the future, therefore, the program is designed to meet this need for flexibility. The program is visualized as a flowing mainstream moving toward its goals with constantly growing offshoots which represent performance criteria in areas of competency which a differentiated school staff might possess. Competencies are not fixed and may be added, deleted, or modified as needed. [See Figure 21.]

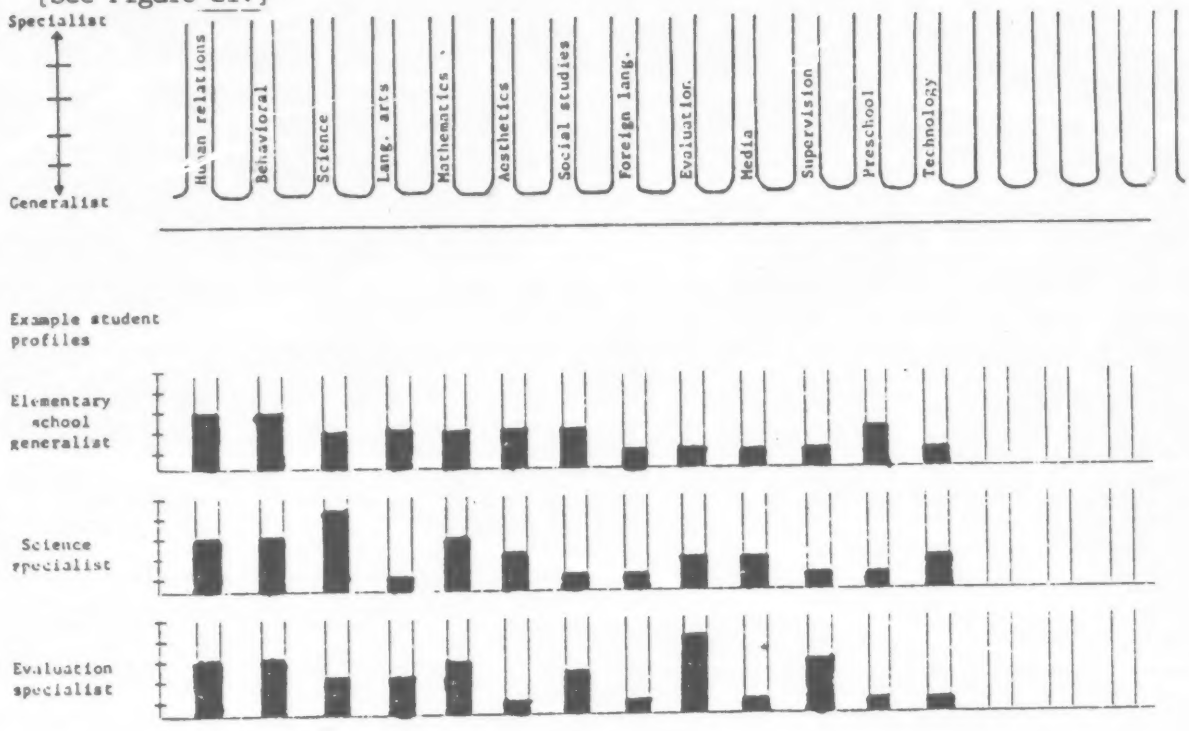



Figure 21

MODEL ELEMENTARY TEACHER EDCUATION PROGRAM

Three competency areas of performance criteria are defined:

Cornerstone Criteria consist of a human relations and a behavioral skills component. Trainees will develop understanding of self and self in relation to others and master the skills necessary for effective teaching.

Content Criteria consist of science, language arts, mathematics, aesthetics, social studies, foreign language, and preschool. Although drawn from traditional curriculum, these areas have been modified to reflect underlying principles of the program.

Service Criteria are identified in the areas of evaluation, media, supervision, and technology. Evaluation includes competencies in tests, measurements, and decision-making skills necessary to implement new curricula. The media area contains criteria hierarchically ordered from simple to complex understandings of audiovisual media and its uses. Supervision area criteria are for effective training of elementary school supervisors. Criteria in technology are written to supplement the regular areas of concentration.

The program is designed to train either a generalist or a specialist teacher. Performance criteria in each areas are defined in hierarchical order from simple to complex. A generalist would be required to achieve a relatively high level of competence in all areas. A specialist would be required to attain a very high level of competence in one area with minimal competency levels in other areas.

A Conceptual Structure for Performance Criteria

Each performance criterion states the expected teacher goal, describes conditions under which it will be met, and tells how the behavior will be evaluated. At least two instructional alternatives are provided for each criterion. Performance criteria have been developed in three broad areas relating to teaching: content knowledge, behavioral skills, and human relations. [See Figure 22.]

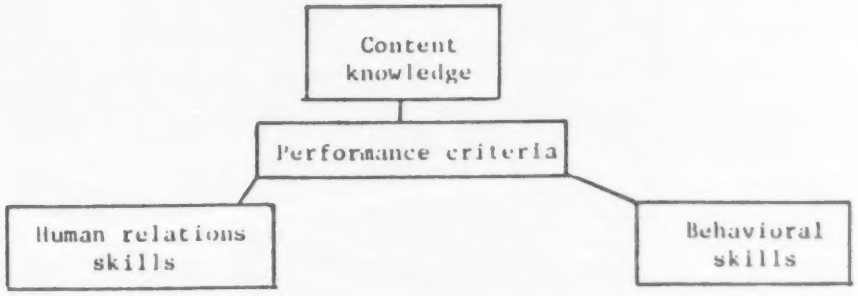



Figure 22
PERFORMANCE CRITERIA

Content Knowledge requirements have been restated from traditional course requirements to performance criteria in the professional area. Content knowledge is defined to include the breadth of content most often seen in liberal

arts plus that most often associated with professional education. The two are viewed as inseparable, the latter being an extension of the former.

Behavioral Skills competencies are aimed at the development of the technical skills of teaching based on the premise that the complex act of teaching can be broken down into simple specific behavioral acts translatable to trainable skills and techniques. Microteaching is one technique for developing such specific skills. It reduces the complexity of the situation while exposing the trainee to classroom variables. Along with skill-proficiency, the trainee is led to become a professional decision-maker. Mastery of the technical skills allows the teacher a set of alternatives applicable to the results to the decision-making process.

Human Relations is viewed as a codifiable set of behaviors that describes what goes on inside a person or between people. It is defined as behavior exhibited in relation to self, other individuals, and to groups.

These competencies are cumulative and interdependent as are the skills and knowledge necessary to produce them. [See Table 5.]

| NECESSARY SKILLS | | COMPETENCY |
|---|---|---|
| Content Knowledge | equals | Subject Matter Competency |
| Behavioral Skills plus Content Knowledge | equals | Presentation Competency |
| Human Relations Skills plus Behavioral Skills plus Content Knowledge | equals | Professional Decision-Making Competencies |

Table 5

THE HIERARCHY OF TEACHING COMPETENCIES DEVELOPED THROUGH PERFORMANCE CRITERIA

Subject matter competency is necessary because teaching requires that knowledge be transmitted, therefore the trainee must assimilate content. A variety of instructional modes may be used to help the trainee reach competency, such as closed circuit TV, programmed instruction, independent study, seminars, and formal lectures.

Presentation competency requires the trainee to acquire appropriate behavioral skills in order to translate content knowledge into teachable form. The technical skills approach to teacher training translates learning theory into principles of teaching. Examples of technical skills relevant to presentation include such procedures as set induction, closure, asking probing questions, planned repetition, and the use of examples.

Professional decision-making competency is required for the teacher to meet instructional objectives. The teacher must make decisions based on the knowledge and skills from all three performance areas. The greater the teacher's content and presentation competencies, the greater are the availalbe alternatives for meeting instructional objectives. Practice in decision-making is required and can be provided through simulation, microteaching, observation of live and taped events, small-group work, and student teaching.

Instructional Procedures. Instructional alternatives for each performance criteria include a variety of such procedures as computer-assisted instruction, simulation, teaching machines, programmed instruction, video taped lectures, seminars, microteaching, roleplaying, and sensitivity training.

Student Teaching is an integral part of the program, but no specfic sequence is provided. Its timing will vary with each student and the attainment of prerequisite comptencies.

RELATIONSHIP OF THE PROFESSIONAL TO THE ACADEMIC COMPONENT

A sequenced program of content experiences is not provided, but with the assistance of the academic faculty, specifications are provided for the content knowledge deemed necessary for a teacher's effective classroom functioning. Content knowledge from the liberal arts is stated in terms of coursework rather than performance criteria. Other institutions may accomodate their unique circumstances to the model.

The University of Georgia

## GEORGIA EDUCATION MODEL
## SPECIFICATIONS FOR THE PREPARATION OF ELEMENTARY TEACHERS

### OVERVIEW

Systematically developed competencies in professional performance and liberal education comprise the core of the program. Competencies are classified according to cognitive, psychomotor, and affective outcomes. All learning activites are directly related to teacher performance behaviors.

Instruction is individualized and the clinical approach is used. A student must meet the prerequisites before undertaking any set of learnings and must show proficiency upon completion. The entire career sequence is six years, divided into three phases with terminal exit points at the end of each phase.

It is a self-paced program and the student is provided continuous orientation and guidance. Evaluation begins with admission when data from numerous sources is used for selection. Thereafter, evaluation measures are prepared for each module, block, and phase of the program. All data are placed in computer storage for both short- and long-range evaluation of individuals and the total program.

The rationale underlying the program is that a program must be adaptable to the changing needs of society and its individuals. This requires projections of future society based on economics, political theory, and social values and projections of the kind of elementary school which will be most effective in the projected future setting.

The program is designed to meet 10 basic criteria: 1) The core of instruction must be a set of comprehensive behaviors which meets the needs of society and its individuals; 2) Candidates selected must have personal characteristics necessary to meet the required outcomes; 3) Learning activities and materials must reflect the most efficient instructional technologies and strategies known; 4) Basic instructional procedures must be clinical and individualized; 5) The sequence of learning activities must be in accordance with established principles of learning and needs of society; 6) Evaluation of student achievement must be based on demonstration of acquired

competencies and must serve as a basis for both student remediation and program modification; 7) Techniques and instruments of evaluation must provide systematic and continuous program modification and improvement; 8) Staff orientation procedures must insure sound implementation and operation of the program; 9) The program must involve numerous state and local agencies for effective operation; 10) The instructional program must determine the administrative organization for implementation.

Performance specifications were developed through the following sequence: 1) determination of broad goals for schools, then school objectives for subject matter, cognitive processes, attitudes, and values; 2) observation of on-the-job teaching; 3) review of theoretical writings of prominent educators; 4) consideration of accumulated knowledge on pedagogy, humanistic learnings, attitudes, sensitivities, and values.

More than 2000 specifications for teacher performance are provided in the following categories: drama, composition, cognitive processes, psychology, tests and measurements, pedagogy, social studies, instructional improvement and professional development, speech, reading, literature, listening, mathematics, media, science, art, music, health, physical education, philosophy, guidance, social foundations, specialized training relating to local conditions.

Each behavior is categorized by its taxonomic outcome(s). Cognitive outcomes include: 1) knowledge, 2) comprehension, 3) application, 4) analysis, 5) synthesis, 6) evaluation. Affective outcomes include: 1) receiving, 2) responding, 3) valuing, 4) organization, 5) characterization. Motor outcomes include: 1) simple action (response), 2) coordinated action (multiple response), 3) action sequence (procedure), 4) system action (accomplishing objective). [See Table 6 for an example.]

SELECTION PROCEDURES

Detailed specifications for candidate selection are based upon investigation of the teacher personnel pool and the teacher performances specified. Provisions are made for candidate selection based on a career field with multiple entry points and paths. [See Figure 23, Figure 24, and Tables 6 & 7.]

| Characteristic | Level of Development: Cognitive | | | Affective | | |
|---|---|---|---|---|---|---|
| | Teaching Assistant | Teacher | Specialist | Teaching Assistant | Teacher | Specialist |
| 3.02.01 Historical background and overview of educational measurement. | | 1 | 3 | | 1 | 3 |
| 3.02.02 Purpose for and components of a test guide. | | 3 | 6 | | 1 | 3 |
| 3.02.03 Different types of items and teacher made tests. | | 3 | 6 | | 1 | 3 |
| 3.02.04 Instructions for and administration of tests. | 1 | 3 | 6 | | 1 | 3 |
| 3.02.05 Normative data. | | 3 | 6 | | | |
| 3.02.06 Interpretation of test scores. | 1 | 3 | 6 | | 1 | 3 |
| 3.02.07 Desirable test characteristics. | | 3 | 6 | | 1 | 3 |
| 3.02.08 Gain experience in finding test information. | | 3 | 6 | | 1 | 3 |
| 3.02.09 Standardized intelligence tests. | | 2 | 6 | | 1 | 3 |
| 3.02.10 Special aptitude tests. | | 2 | 6 | | 1 | 3 |
| 3.02.11 Achievement batteries. | | 2 | 6 | | 1 | 3 |
| 3.02.12 Techniques of self-appraisal. | | 2 | 6 | | 1 | 3 |

Table 6

EXAMPLE OF PERFORMANCE SPECIFICATIONS--EDUCATIONAL TESTS AND MEASUREMENTS

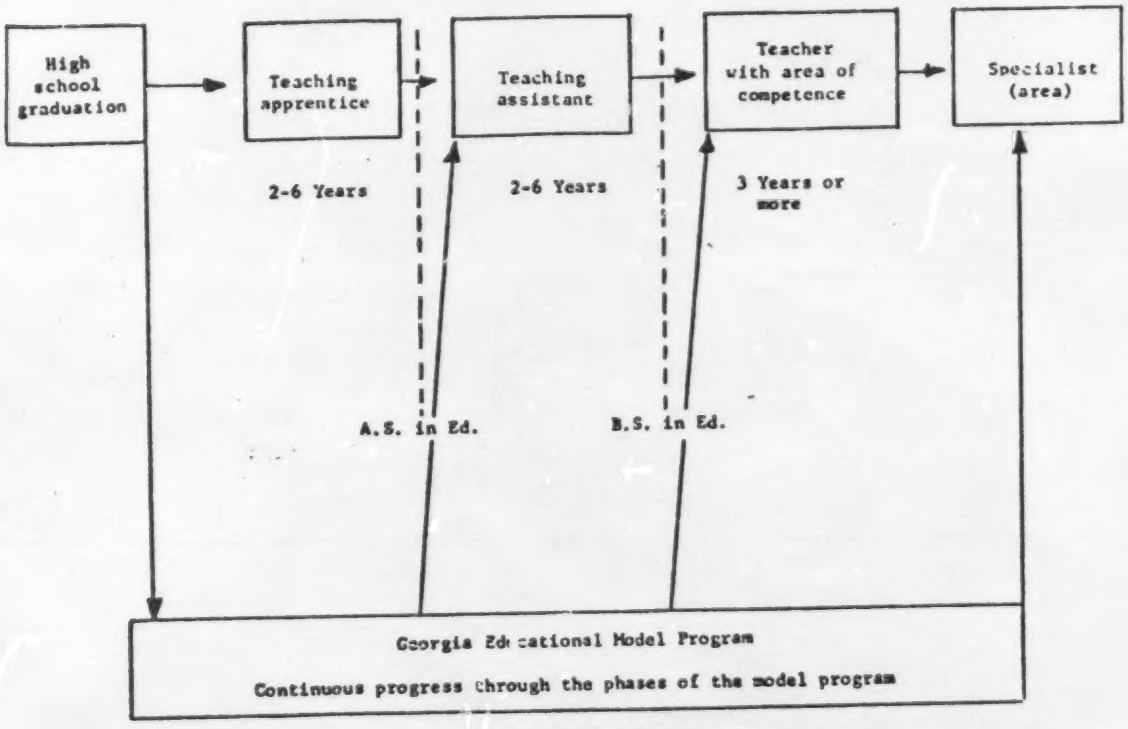



Figure 23

PATHS IN THE TEACHER CAREER FIELD

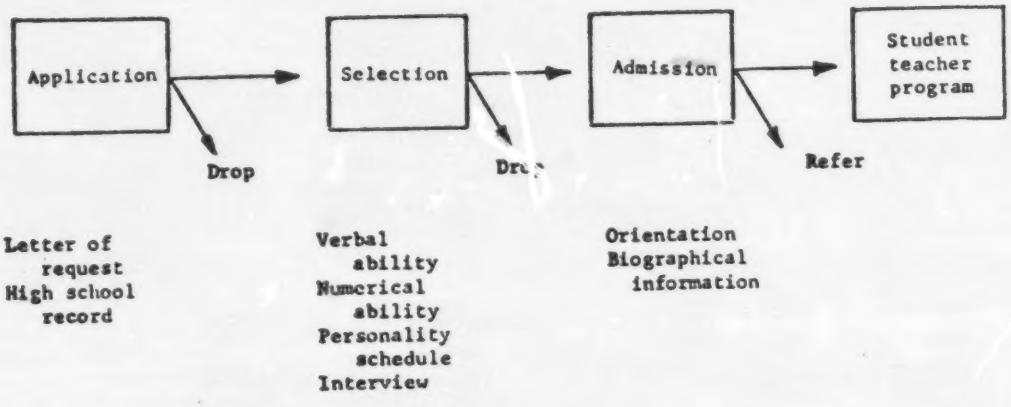



Figure 24

STUDENT ADMISSION SEQUENCE

| Personnel category | Qualitative (e.g., SCAT) | Quantitative (e.g., SCAT) | Interest (strong for teaching area) | Biographical information blank | [illegible] | [illegible] |
|---|---|---|---|---|---|---|
| Teacher apprentice | 500 | | B | * | * | |
| Teacher assistant | 500 | | B | * | * | |
| Teacher (area competent) | | | | | | 50th percentile in high school |
| Language arts | 500 | | B+ | * | * | |
| Mathematics | 500 | 500 | B+ | * | * | |
| Social science | 500 | | B+ | * | * | |
| Science | 500 | 500 | B+ | * | * | |
| Art | 500 | | B+ | * | * | |
| Music | 500 | | B+ | * | * | |
| Foreign language | 500 | | B+ | * | * | |
| Physical education | 500 | | B+ | * | * | |
| Specialist | (GRE) | (GRE) | (GRE Ad. Test) | | | |
| Reading | 500 | | 500 | | | |
| Mathematics | 500 | 500 | 500 | | | |
| Social science | 500 | | 500 | | | |
| Science | 500 | 500 | 500 | | | |
| Art | 500 | | 500 | | | |
| Music | 500 | | 500 | | | |
| Physical education | 500 | | 500 | | | |
| Guidance | 500 | 500 | 500 | | | |

*Any significant deviation from normal will be cause for interview by psychologist.

Table 7

SCORES REQUIRED FOR ADMISSION

INSTRUCTIONAL COMPONENTS

Instruction is generally presented through a proficiency module which is utilized for presenting instructional activities that directly relate to specified behaviors. The proficiency module is designed to guide student learning, through group interaction and independent study, toward acquiring particular affective, psychomotor, and cognitive learnings. Proficiency modules are based on such processes as problem-solving and creativity and duplication of content is avoided. Before undertaking a proficiency module a student must provide evidence of having met the prerequisites. A pretest is analyzed and student and instructor mutually agree upon a course of action. The student may propose personal objectives and activities as an alternative to the proficiency module. This sequence of events is designed to individualize instruction. [See Figure 25.]

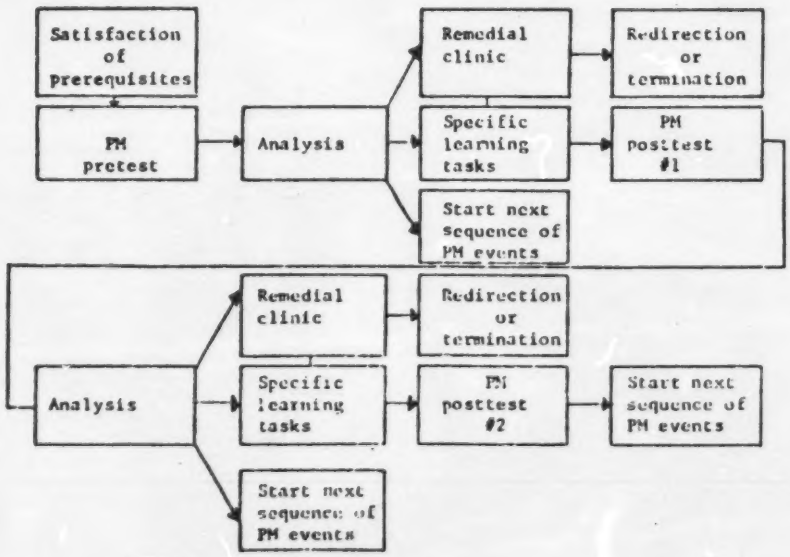



Figure 25

SEQUENCE OF EVENTS DESIGNED TO INDIVIDUALIZE INSTRUCTION

The Instructional Components

Professional Preservice Component (Phase I) is roughly the equivalent of the first two undergraduate years. It provides the beginning of a liberal arts education and preparation for paraprofessional service as a teacher aide, terminated with an associate's degree. 10% to 20% is devoted to professional education, the rest to liberal arts. Running continuously with the six proficiency module blocks is an education seminar concerned with the study of

paraprofessional activities and human growth and development. During the second and fifth blocks, students receive approximately six weeks of supervised laboratory experience, carrying out paraprofessional activities in the classroom.

Professional Component (Phase II) is roughly the equivalent of college junior and senior years. It prepares a candidate for certification, completes the liberal education requirement, and provides an area of teaching competency. It satisfies the bachelor's degree requirements and provides the prerequisites for admission to the specialist program. 40% to 50% is devoted to professional education, the rest to liberal arts. Education seminars are continued under different leadership with different objectives. Students continue pursuit of individualized instruction through proficiency modules. Each student selects an area of concentration from language arts, social sciences, natural sciences, mathematics, health education, music, art, foreign language, and human development. Approximately six weeks of experience in a school setting is provided, plus an additional 10-week internship near the end of the component.

Inservice Component (Phase III) is a graduate specialist program offering 15 areas of specialization: language arts, social sciences, natural sciences, health education, art, music, foreign language, human development and learning, professional development, evaluation, instructional media, pupil personnel, curriculum and program planning, school-community relations. The phase is divided into three areas: 1) training related to local conditions—prepares the teacher for optimum effectiveness in adapting to or modifying unique local conditions; 2) instructional improvement and professional development—provides for self-evaluation, study of new techniques of instruction, and continued general involvement as a professional educator; 3) specialization through exploration--proficiency modules are provided to continually increase the competence and effectiveness of the teacher. A portion of these are a required core; others are sequentially arranged in a selected area; still others provide for flexibility of exploration.

Relationship of the Professional to the Academic Component

At the preprofessional level, proficiency modules are specified for language arts, social studies, natural sciences, fine arts, mathematics, and health, safety, and physical education. In the professional phase, specifi-

cations require extensions of these plus additional study in the selected area of competence. Liberal arts and professional studies are integrated to the largest possible extent.

EVALUATION

Evaluation data includes those obtained from candidate selection, examination before and after instruction, follow-up procedures, and cost effectiveness analysis.

Proficiency modules require pre- and post-tests. The type of instrument used depends upon the behaviors to be evaluated and a variety of evaluation devices are used. [See Figure 26.]

| The student accomplishes the following objectives: | Supporting content | Process used in measurement: Recall | Comprehension | Application | Analysis/ Synthesis | Evaluation | Total no. of items |
|---|---|---|---|---|---|---|---|
| Learns a brief historical background of educational measurement | Work of Wundt, Galton, Cattell, and Binet. Measurement in for periods since 1900 | 3 | | | | | 3 |
| Acquires a brief overview of measurement | Evaluation and measurement, observational techniques, functions measured, individual differences | 4 | | | | | 4 |
| Develops an understanding of teacher-made tests | Objectives, processes, content, item types, scoring, characteristics | 1 | 2 | 2 | | | 5 |
| Writes test items | Multiple choice, essay, true-false, matching | 1 | 1 | 1 | 1 | 1 | 5 |
| Administers the test | Directions, timing, key, reproduction of test, scoring | 1 | 1 | 1 | | 2 | 5 |
| Interprets the test | Frequency distribution, mean, mode, median, histogram, standard deviation, correlation | | 1 | 1 | 2 | 1 | 5 |
| Prepares and presents normative data | Descriptive statistics, percentiles, standard scores, profiles | 1 | 1 | 1 | 2 | 1 | 6 |
| Acquires an understanding of desired test characteristics | Reliability, objectivity, practicality, criterion, validity | | 1 | 1 | 2 | 2 | 6 |
| Gains experience in finding test information | Sources, types of information, test evaluation procedures | | 1 | 1 | | 3 | 5 |
| | | 11 | 6 | 6 | 7 | 10 | 44 |

Figure 26

EDUCATIONAL TEST MODULE GUIDE

The results of each test are placed in computer storage. Objectives and supporting items are numerically coded. The computer is programmed to tabulate student responses and item characteristics.

...ther testing devices include standard tasks, performance guides, pro-...ts of performance, and related measures, such as pupil evaluation.

...ogress Review is periodic and usually results in the student advancing ... the next block or phase of the program. Should progress be unsatisfact-...y, the student may transfer to another program or be advised to enter ...aching at the paraprofessional level.

...ata Analysis

Data obtained are analyzed to determine if objectives are achieved and if the various subsystems are effective. Analysis includes such statistics as normative data, item analysis, reliability, analysis of variance, factor analysis, cost effectiveness, and validity. Data processed provides information on such things as item difficulty, internal consistency, means, standard deviation, and reliability.

PROGRAM MANAGEMENT

Specifications for administrative functions are determined by functions within the program. A description follows. See Figure 27 for the organizational structure.

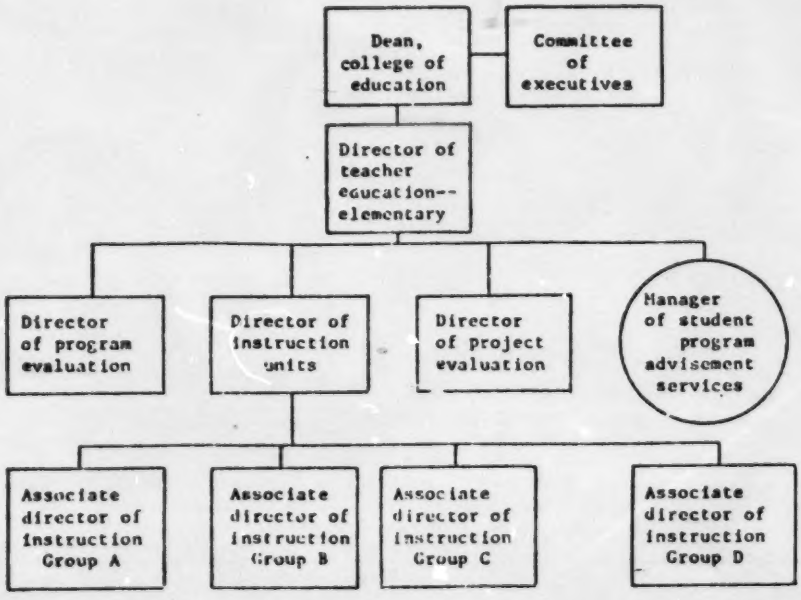

Dean, college of education
Committee of executives
Director of teacher education--elementary
Director of program evaluation
Director of instruction units
Director of project evaluation
Manager of student program advisement services
Associate director of instruction Group A
Associate director of instruction Group B
Associate director of instruction Group C
Associate director of instruction Group D

Figure 27

DIAGRAM OF SPECIFICATIONS FOR BASIC ADMINISTRATIVE ORGANIZATION

Dean of the College of Education is the head administrator working with an executive committee drawn from all colleges responsible for teacher preparation, superintendents of schools, and representatives of state education departments.

Director of Elementary Education is the chief of the program and directs three directors of professorial status and one manager. Directors are of instructional units, program evaluation, and project evaluation. The manager manages the student advisement services.

Director of Instruction is directly responsible for curriculum structure and aided by staff, supervises the separate instructional units.

Director of Program Evaluation is concerned with the entire evaluation of the ongoing program, including long-term and follow-up evaluation.

Director Of Project Evaluation is an outside observer with no operational responsibilities nor direct involvement. He/she establishes and coordinates the work of a panel of outside consultants who evaluate the operations of various program components and provide evaluative data to all concerned.

Manager of Student Advisement Services is familiar with program requirements for admission, program sequences, transitional and terminal degree programs, and general rules and policies of the institution; supervises the work of three coordinators, one for each phase of the model, who facilitate the work of advisors and instructors.

Each instructional unit (A,B,C,D) has an advisory board, director, and manager, and three associate managers in charge of clinics, instructional unit laboratories, and group interaction learning experiences. Instructors of instructional units report directly to the director of the instructional unit, but their work is facilitated by the managers.

OTHER PROGRAM FEATURES

Laboratory experiences are provided through five required laboratory facilities: 1) general resources laboratories which include facilities used by all students of the university and public school; 2) instructional units central resources laboratories which provide equipment and materials essential for undertaking particular proficiency modules which are not available in general facilities; 3) instructional remote field laboratories which provide field services as needed; 4) clinics which provide remedial services; 5) instructional

unit interaction laboratories which arrange such special activities as seminars, workshops, and lectures.

Comprehensive student orientation and advisement programs are required to provide security and social interaction while students move at self-paced rates through the program. Advisors are required to conduct weekly planned seminars to discuss problems of professional and educational concern and to keep liberal office hours for individual student consultation.

Reciprocal commitments are required from the participating local and state agencies, school districts, and universities. School districts are required to cooperatively participate in the training of teachers and to provide exchange personnel to work in the program on a shared basis. School systems must also provide materials, laboratory settings, opportunities for paraprofessional employment of students, and recommendation of certain students for special training. They also share curriculum libraries and classrooms for study, reference materials, school learning materials, and provide a base for observation, paraprofessional participation, supervised teaching, field studies, and demonstrations.

At the state level, reciprocity is reflected through commitments for degree awards and certification in connection with the program. Reciprocal agreements with two-year colleges parallel the paraprofessional phase of the program. Agreements are also made with research and development centers, regional laboratories, and other units concerned with similar or related aspects of education.

Reciprocal commitments with project staff call for early and explicit arrangements on authorship rights and royalties since the likelihood of materials being produced for wider distribution is likely.

Year-around education is encouraged by the program, eliminating the need for quarters, semesters, etc. This provides for continuing and efficient use of student and faculty time. Registration can occur whenever a suitable number (25-30) of students are ready to begin.

Other aspects include mastery criteria as a determiner of success, thus eliminating the need for traditional letter grades and a transferrable teach-as-taught effect which will hopefully affect structure, strategies, and individualization in the classrooms of program graduates.

# OTHER APPROACHES

## Short Summaries of Exemplary Programs

Brigham Young University's (Utah) RURAL TEACHER TRAINING PROGRAM recruits and trains teachers to function successfully in rural school settings. Recognizing that rurally-based schools have unique needs and that rural teachers must be able to adapt to unique local conditions, an education consortium representing rural school districts, the university, a regional service center, and the Utah State Educational Agency was formed to inititate and operate a teacher training program for rural schools.

A field-based competencies approach to training is used with training manuals developed to aid trainees participating in the program. Two rural training centers are in operation. Student teachers may complete the majority of their professional coursework on-site as they spend 8 to 16 weeks in a selected rural school area. Each training location has a program center where trainees may achieve rural performance-based objectives, attend seminars, and gather for social meetings. Cooperating teachers are trained by the university. A center director is responsible for housing trainees, scheduling seminars, and supervising and evaluating the training objectives completed by the students. A university supervisor visits trainees on a regular basis. Special programs of this nature are important to rural schools where distance from urban centers, unique local cultural conditions, and community aspirations pose special problems in recruiting teachers who can function with professional efficiency and personal/social ease within the constraints of community life.

Utah State University's ELEMENTARY TEACHER EDUCATION PROGRAM is a multicultural, performance-based, field-centered program which utilizes portal schools as partners in teacher education. It is an interdisciplinary and interdepartmental program which draws on staff from the departments of psychology, special education, and family and child development who work in conjunction with the department of education. The program is known by the acronym SODIA which represents the first letter of Self, Others, Disciplines, Implementation, and Associate. This describes the major focus of each of five program levels. Each program level includes on-site experiences in the portal schools. Three dimensions of competencies are identified:

1) personal relations, 2) teaching skills, 3) subject knowledge. Program evaluation is based upon student performance toward reaching a level of specified competence in these dimensions. The portfolio method is used in which the student assumes primary responsibility for presenting evidence of his/her competency. The program is exemplary from two points of view: 1) it emphasizes the importance of multi-cultural understandings and acceptance; 2) it involves students in competencies within the field of special education. The latter is extremely important in light of contempory philosophy and action in "mainstreaming" many students with special learning and/or handicapping conditions into the regular elementary classroom.

Fordham University (New York City) and the Angelo Patri Intermediate School formed an educational partnership to jointly establish an open-space school in a highly complex, low-income, inner-city environment. The program focused on: 1) collaboration in inservice education, 2) new and changing roles for the school superintendent, 3) a reappraisal of the university's role in inservice education, 4) school-community interaction, 5) open education as a viable alternative to traditional programs, 6) adapting college courses for on-site inservice delievery, 7) assessment of professional staff needs, 9) relationships between school design and educational process, 10) preservice teacher's role in quality education, 11) the school based trainer of teachers, 12) curriculum development—goals and strategies, 12) incentives fo inservice teachers, 13) the supervisor as a school instructional leader, 14) the urban mission of the university. For the program to be effective, it was necessary to maintain close collaboration and a good working relationship with the teacher's union. The union was instrumental in providing great insight into its position on teacher evaluation.

University of Houston (Texas) TEACHER CORPS PROGRAM is a two-year internship at the graduate level for persons holding a bachelor's degree from fields other than education. The program focuses on elementary school education, urban education, and the education of bilingual children. There are 11 generic teaching competencies presented: 1) teacher-made teaching aids, 2) student-centered teaching methods, 3) teacher-centered teaching methods.

4) individualized instruction, 5) learning centers, 6) team teaching, 7) differentiated staffing, 8) open-classroom organization, 9) parent-teacher conferences, 10) teacher record-keeping responsibilities, 11) models of teaching. The program leads to a master's degree in education and provisional certification.

The Teacher Education Alternatives Model (TEAM) is an attempt to implement many of the principles and ideas articulated in the humanistic movement into a teacher preparation program. The main process-oriented themes of the program are: experiencing, decision-making, cooperating, and evaluating. These are implemented through four learning modes: 1) field experiences, 2) goal setting, 3) seminars, 4) learning projects. A decrease in time devoted to traditional courses is complemented by increases in student interaction with faculty and materials through conferences, seminars, and projects, and through field experiences. A teacher candidate in TEAM typically spends five quarters in field experiences at various schools. Another feature is the integration of subject areas and on-campus learning with the field experiences. A differentiated staffing pattern is provided with faculty serving in three basic roles: coordinator, advisory group leaders who meet weekly with students for personalized needs in relation to learning, goal setting, and evaluation; and special area faculty who are responsible for subject matter presentation and field supervision.

The integrated day teacher education program is another humanistically based program aimed at providing experiences which will make schools healthy places for both teachers and students. It attempts to lead teachers to share in decision-making, actively participate in learning, and to become independent learners in their own right. It is addressed to both pre- and inservice teachers and is operationalized through a series of learning experiences which have replaced conventional methods and curriculum courses. Activity-oriented workshops are offerred in multi-arts, math and science, language arts and reading, curriculum building, social studies, and human relations. While learning activities vary from lectures, to slide shows, to task groups, to finance committe meetings, all are competency-based. Preservice teachers demonstrate their competencies through learning fairs,

projects, peer teaching, and weekly day-field experiences. Learning experiences are often integrated and competencies overlap subject areas so that the preservice teacher can work toward several competencies at once.

A Collaborative Approach to Inservice Staff Development (TRAINER-OF-TRAINERS) involves the use of a school-based intermediary training corps. The aim of the program is to spread the effect of training which is delivered by an external university training team to a school staff, throughout a school district by building the internal capacity of the district to plan and deliver its own inservice program. Collaboration between the university and school district is viewed as essential to the program in needs assessment, goal formation, planning, and training. The steps involved in developing a trainer of trainers program are planning, corps planning, school training, and support. Initial evaluation of the program indicates that: 1) program design is strongly accepted by district personnel, 2) participation in program planning and implementation by program participants is encouraged, 3) growth is evident in both the trainees and the participating school staff, 4) skills of resource teachers are strengthened in areas of training, reading instruction, use of paraprofession and community resources, and techniques for individualized instruction.

The emphasis in new programs for teacher preparation on collaboration between university and school and other interested agencies and institutionsin the development and implementation of programs has generated new approaches to both pre- and inservice education. Out of the partnership or consortium which is established, a new type of clinical setting, or teacher center, emerges which provides new bases for sharing of resources and personnel and new attitudes and practices in inservice education. The teacher-center concept is in and of itself a new institution for teacher preparation and for the continuum of ongoing and life-long learning for the classroom professional and other staff members of the public school.

There is no one model for a teacher center, no one mode of operation, no one method of financing, no one specific goal. There is a common goal of improving instruction to children through various paths for upgrading teacher competency, knowledge, motivation, and self-renewal.

Teacher Centers and Inservice Training

The primary purpose of teaching centers is the improvement of instruction (Schmieder & Yarger, 1974.) However, teaching centers alone cannot accomplish this. Quality personnel and continually improving conditions for teaching must also be present.

Teacher centers bring together theory and practice, preservice and in-service education, curriculum and staff development, and various educational agencies and institutions in a cooperative partnership relation.

The results of a study conducted at Syracuse University (Yarger & Leonard 1974) highlight and summarize the present state of teacher center development. Data were obtained from a 10% random sample of over 11,000 school systems in 47 states; a random sample from over 850 colleges in 50 states; and a select sample of over 200 sites nominated by leaders in the field of teaching centers.

## Highlights of the Study

Location and target populations. School-district programs tend to be rurally-based; university-based programs center in urban areas. Centers are more often affiliated with large than with small universities; more often with large than with small school districts; more often with public than with private institutions.

Program Focus. School-district programs are more likely to have specific problem focus. Some common focuses by priority are: individualized instruction, classroom management, humanizing education, open education, skills training in developing curriculum and educational materials. Pedagogical programs are more prevalent than those related to specific academic content.

Scheduling, incentive, cost. Center activities are more prevalent during the school year than during summer vacation. Summer activities are usually in conjunction with university teacher credit programs. Center hours are usually in the late afternoon and evenings.

Schools use credit toward advanced salary status and released time for incentives. Universities offer college credit leading to advance degrees.

Costs to participants are in terms of time, tuition fees, transportation, and other personal costs.

Clients. Centers serve inservice teachers, school administrators, but few paraprofessionals or community residents.

Evaluation. Centers are evaluated informally on the basis of percpetion and opinion with little emphasis on accountability. Many centers have no permanent facility, therefore the emphasis is on process.

Governance and Staffing. Most centers are a consortium, either legally or formally organized between a university and a school. Direction and staffing are often on a part-time basis by already employed personnel. This part-time aspect is integrative to the institutional aspect—the center is operational within the "regular" educational structure

Financing. A large percentage are funded by outside agencies.

Summary. Although called teacher centers, in the long run they will be judged by the impact they have upon children.

## TYPOLOGY OF TEACHER CENTERS

### Organizational Types

Independent Teacher Center. Most are supported by private foundations and have no formal affiliation with an established institution. They are characterized by freedom and flexibility and the absence of bureacracy and red tape. Teachers involve themselves on a voluntary basis. The center deals with individual teacher needs.

Almost Independent Center. These usually have a link to an educational institution and are characterized by high autonomy which is directly linked to program personnel. Involvement is voluntary with the emphasis on perceived client needs or perceived program leader needs, rather than institutional needs.

Professional Organization Center. There are two basic kinds: 1) those which are negotiated by the teacher association or union on a contract basis; 2) those of a subject area orientation which are established by the concerns of a subject-focused organization. The organizational sturctures will vary. The negotiated center tends to focus on educational and professional problems; the subject-area center emphasizes a high-priority classroom subject. The subject-area center has a great deal of independence.

Single Unit Center. This is the most common type. It is characterized by association with, and administration by, a single educational institution. It has greater organization, more sophisticated programs, more thoroughly developed goals than a regular inservice program. It is externally funded and institutionally administered. Program development is closely tied to

and institutionally administered. Program development is closely tied to approved institutional goals.

Free Partnership Center. This is the simplest form within the consortium concept. It is usually a partnership of school and college or university. The partnership is entered into willingly. The program tends toward accomodation of needs and goals for both partners.

Free Consortium Center. Three or more institutions willingly enter into the center relationship. Organization, commitments, and policy are more complex than the free partnership center. External financial support is often a catalyst in its formation. Program development is more general because goals and contraints of all parties must be considered. Its continuation is directly related to members' abilities to see the merits of the program. First phase development tasks take longer because of the necessity to build trust, but usually have long-range impact and pay-off.

Legislative/Political Consortium Center. Its organization and membership are characterized by legislation or political influence and its process is often governed by a state education agency. Often there is financial incentive for participation. Complex communications systems for program development are characteristic. The organization may range from sub-county to state-wide. Inservice education is moved from the schools to the center. In some states this is the recommending institution for certification.

Functional Types

Facilitating Teacher Center. It seeks to improve cooperating efforts of teachers and provides an atmosphere promoting innovative ideas and techniques through teacher interaction or hands-on experiences with new curriculum materials. There is no specific program. Professional growth is a function of the needs and initiatives of voluntary participants. It serves a heuristic, collegial, and social function.

Advocacy Teacher Center. It is characterized by a particular philosophy or commitment. It may provide concepts such as open education, competency-based education, differentiated staffing, and so on, but is usually limited to a single orientation.

Responsive Teacher Center. There are two kinds: 1) one responds to the needs of individual educators; 2) one responds to specified institutional needs. Both have implied needs assessment and commitment to develop programs with mutually derived objectives. They are designed to help the client identify needs, then provide training to fill those needs. The center is characterized by diverse programming with reliance on outside resources.

Functionally Unique Teacher Center. This is designed for limited function, such as materials development, research, field testing of materials, etc. This is the most directly child-related type of center.

TEACHER CENTERS IN ENGLAND

There are perhaps 500 or more local teacher centers in England and Wales which are essentially curriculum development centers. Although encouraged by the Schools Council, they are supported by the Local Educational Authorities and reflect an increasing realization that teachers need to constantly update their knowledge of the subject areas and related teaching methodologies. There is also a growing trend for these centers to establish links for cooperative endeavor with teacher training institutions, especially when particular development activities are seen to be of mutual concern.

Although referred to as curriculum development centers, they undertake a variety of projects which adds new and broader dimensions to the term "curriculum." Project areas are: curriculum change (objectives and content), innovation and improvement of teaching techniques, use of instructional media and other educational technology, and the development of instructional materials. The wide variety of specific projects and activities is reflective of the considerable amount of flexibility which exists in the British approach to curriculum development.

Teacher participation is voluntary, but is encouraged by the Local Educational Authorities. Outcomes of projects have included the production of entirely new teaching materials, revised curriculum documents, and study reports. Many centers provide means for cross-communication among centers through newsletters and bulletins in which they report their activities.

The School Council's journal Dialogue reports on many of the activities reported by the centers' publications.

The Regional Development Centre (Center) is an extension of the basic concept described above. It is an organization created to give broad stimulus and direction to the curriculum effort. The Regional Center is a cooperative group sponsored by a partnership of Local Educational Authorities and teacher training institutions. If there is a local operational center, it becomes part of the cooperative effort. The combination of an institution which has responsibility for teacher education and organized teacher groups working together greatly enhances the possibilities for inservice curriculum development work with teachers.

The first Regional Development Centre at Manchester serves as a model for this type of agency's potential in curriculum development. At first it was financially supported by several agencies and institutions. It is now entirely supported by the Local Educational Authorities in the area. A 1967 project in curriculum development exemplifies the basic mode of operation: leadership and responsibility for developing the various subject areas were shared by participating local centers, but final decision-making for the project was reserved for personnel employed at the regional level.

## OTHER EXEMPLARY TEACHER CENTERS AND INSERVICE PROGRAMS

The Comprehensive Education Center at Plattsburgh State University (New York) provides both pre- and inservice teachers with a variety of services. It provides free and expert consultation and instructional services in the areas of art education, curriculum evaluation and development, educational research design, preparation of proposals for external funding, reading, mathematics, science education, and the analysis of teaching behavior. In addition, a library-media-curriculum materials center offers specialized books and materials to the faculties of area schools. A laboratory school is also provided through the educational research and demonstration center. The center emphasizes research on the development of representational drawing, logical thinking, language, and personal identity. The Comprehensive Educational Center not only deals with individual needs and interests, it also is involved in those general problems affecting the quality of education

in the northeastern region of New York State.

The University of Maine at Portland has developed five education learning centers with the broad goal of integrating theory and practice in teacher education. It is also aimed at developing methods to more effectively utilize university and public school resources, shaping responsibility for teacher education, providing inservice teacher education, and extending individualized learning experiences for teacher-interns and for children. Juniors and seniors spend an academic year in a center with their professional courses delivered on-site. Formal and informal evaluations of the center indicate that: 1) interns in centers exhibit greater internal motivation, greater transferrability from theory to practice, more effective self-appraisal and positive self-image, a more pragmatic philosophy of education, and higher achievement in courses, than do students in traditional programs; 2) Public school teachers, administrators, and university faculty benefit from inservice programs and have more open communication and more opportunities to exchange roles than do similar personnel not involved in a center.

The Fort Worth Teacher Center (Texas) has four objectives: 1) improvement of both participating schools and teacher training through field-oriented experiences; 2) development of a viable educational enterprise involving a public school district, educational service center, teacher training institute, and the community; 3) establishment of a plan for curriculum and staff development; 4) development of a program for integrating professional competence in teaching concepts. The center operates through an advisory council composed of representatives of the Fort Worth School District, the professional teachers' association, classroom teachers, Mayor's Council, community members, higher education institutions, and student teachers. The center serves in a cooperative capacity to improve teacher education through preservice and inservice meetings. University participation includes the placement of several hundred students in community classrooms in observational, volunteer, and teacher-aide positions.

A number of teacher centers are organized around educational technology. The Educational Media Center at the University of Michigan School of Education is one that attempts to provide the technology necessary for a

competency-based teacher education program. It has facilities for storing, producing, promoting, and disseminating learning resources. A media library serves as a model of a school library to train prospective teachers and library media specialists in the use of school media centers. The audio-visual library, which includes a multimedia classroom workshop, conducts a series of workshops each semester to train teacher education students in media competencies. A self-instruction laboratory is equipped with adequate hardware for the faculty to develop modular units and for the students to instruct themselves in the operation of nonhuman resources and the design and production of inexpensive graphics materials. There is a graphics laboratory which has equipment for dry mounting and laminating, photographic copying, and production of transparencies and overlays. The closed circuit television studio and control room is used to develop videotapes which supplement classroom instruction. This comprehensive technology center described by Warren Palmer (1974) is one of the most exemplary of its type.

A basic step to be taken when planning the development of a center or an inservice education program is the assessment of the needs of the partipants. A 1975 study (Gary M. Ingersoll) was conducted for such a purpose which shed some light upon general needs that one might anticipate. This study indicated that: 1) teachers felt a definite need for training in the affective area; 2) Differences of needs clearly indicated that any such program must provide differentiated training within the inservice program per se. It is necessary to recognize, not only differences in the opinions of staff relative to need, it is imperative to recognize the differences in levels of skill and areas of specialization.

# SUMMARY

## Overview

The impact of rapid change and technology is a powerful force with which the educational institution at all levels must deal. This report provides a basis for diagnosing the needs and problems facing teachers and teacher training institutions and also provides a framework for developing a basic awareness of some of the alternatives for applied change—innovation—within the system. Ideally, the educational community in its largest sense, should concur on the need for planned change and the methodology which may be employed to bring such change about. If such a consensus cannot be arrived upon, it is still possible to meet the challenge through efforts on the part of affected subsystems—regional partnerships, universities, public schools, and teacher organizations.

Innovation in the form of systematic planning and implementation must occur if the educational system is to be open and self-renewing. If education does not react to the outside forces impinging upon it, it will in essence self-dissolve or cease to exist or it will exist in a state of nonproductivity and social-cultural unimportance with its life-functions being assumed by other types of organizations and institutions.

## The Vehicle for Change

The question is, how can the system or the subsystem acquire permanent change and how can it become self-renewing so that once change is institution-the specific components, events, and roles an innovative structure may introduce as part of change binding the system in a new, equally rigid structure? duce as part of the change bind the system into a new, but rigid structure? The answer to this question lies in a process approach which requires analysis, structure, planning, purpose, and an agent to effectuate the necessary change. It also requires new direction and new designs in teacher education which proceed from a model providing causative and process guidelines for a new foundation of educational methodology.

The vehicle for change is in the role of change agent. Havelock (1975) defines four critical roles that the institutional change agent must perform: 1) A catalyst who applies pressure to stimulate the organization out of

inertia and into action; 2) A solutions expert who not only has a grasp of the possible solutions, but is able to present and apply them with tact and good timing; 3) A support-system person in the process of change who helps the system identify and define needs; acquire resources; create, adapt, implement, and evaluate solutions; 4) A coordinator or resources who can bring together people, facilities, money, ideas, and energy.

Earlier parts of this report have identified the change agent as teacher-innovator, institution-builder, creative manager, and social systems designer. While the change agent may effect change from outside the institution, once decisions to change have been made, the most effective agent for continuous, ongoing, and self-renewing change is the teacher within the system. Therefore, it is a priority for teacher training programs to prepare candidates as agents of change.

New roles for teachers have been identified in this report as falling into two broad categories: 1) Demonstrated competencies based upon performance criteria developed from functional teacher-task analysis; 2) Exhibited behaviors and observable indicators of basic personality traits necessary for functional adaptability to change.

The first broad category includes, but is not limited to, demonstrated competencies in such areas as questioning techniques, instructional and curriculum design, instructional strategies, enabling and terminal behavioral objectives, tests and measurements, formative and summative evaluation, research and development, individualized and personalized instruction, instructional management and facilitation, selection and organization of content, and structuring the learning environment.

A comprehensive summary of the second broad category, which is also descriptive of tasks and role-needs of the effective change agent, includes such descriptors as: 1) Ability to open-mindedly experience the world in a personalized and innovating manner; 2) Ability to live with complexity, ambiguity, and contradiction; 3) Openness and receptivity toward new approaches, feelings, and attitudes; 4) Flexibility and imagination combined with organizational skills; 5) Ability to perceive, investigate, and solve problems; 6) Acceptance of nonordinary realities; 7) Self-origination and persistence; 8) Self-actualization; 9) Self-awareness; 10) Self-confidence;

11) Self-motivation; 12) Positive and realistic self-concept; 13) Originality combined with fluency; 14) Wide interests; 15) Sensitivity; 16) Energy; 17) Psychological health; 18) Willingness to take risks; 19) Commitment; 20) Decision-making ability; and 21) Mastery of all the tools required by any specific task which encompasses both broad categories, plus the area of content knowledge and informational acquisition provided through the liberal arts, humanities, and sciences.

While the list of descriptors in the second broad category does indeed summarize the personality characteristics indicative of the change-agent--the teacher who can deal with change--it is actually a summarized list of descriptors identified by Luthe (1976) as "pro-creative"--behaviors either fostering or indicating individual creativity. The impact of the inherent nature of these characteristics upon future program design in teacher education appears quite clear. Programs must be desinged which set a priority upon experiences enabling the development of personal creativity as well as experiences which enable the acquisition of content knowledge and teacher-task competencies. Future programs must be comprehensive in nature, providing an appropriate balance of experiences based upon individual assessment of previous development and subsequent needs in all three areas of human endeavor. The openness, flexibility, and adaptiveness inherent in creative behavior styles are not only necessary to meet the demands of change per se, they are crucial to the mastery of all the tools required to implement, facilitate, and manage highly complex instructional systems within the technostructure of education.

A Process for Implementation

The primary agent for change must have the decision-making power which enables old guidelines, programs, and goals to be replaced with those which are developed through innovation. This primary change agent might be an individual, a group of individuals, or a significant organization or institution within the larger system. But the principal environment where change must occur is at the preservice and inservice levels of teacher training. Havelock (1975) has identified six stages of change which describe the steps and process necessary for the change agent to facilitate:

1) First, a working relationship with the recipient of change (client system) must be developed. As essential ingredient to the viability of this relationship is based upon the assistance or help which the change agent may be either authorized and/or willing to provide.

2) Once the client system has accepted the change agent, the change agent must assess client needs and find a way of making the client aware of these needs. Finally, the change agent acting in this stage of diagnosis, must assist the client system in defining the needs identified.

3) Once the problem(s) is defined, it is then necessary to identify and secure the resources necessary to enable solutions to occur.

4) With the problem defined and resources made available, it is then necessary to identify possible implications, develop a set of alternate solutions, and decide on the solution or solutions which will be best for the system.

5) Solutions which are adopted must be presented to the system through discussion, demonstration, and other means of open and clear communication to gain system acceptance of the innovation. This requires the ability to tap innumerable resources and to coordinate the stage of acceptance through leadership combined with effective communication. If communication and leadership are effectively provided, the client system will develop the attitudes and behaviors necessary for support of the innovation.

6) The client system must implement the innovation and develop a means for maintaining innovation through self-renewal. The most effective method for accomplishing this goal is based upon a minimax rule—minimum effort with maximum results. Members of the client system must be trained in the skills, behaviors, and attitudes necessary to become effective change agents, reacting to outside influences from within the system.

This process is compatible with, supportive of, and reflected through the position and precepts presented in this report. Change must occur in teacher training programs, and that change must embody a process for developing individuals who are capable of dealing with, managing, and effectuating change while skillfully performing the active tasks of interactive classroom teaching behavior.

## GLOSSARY

accountability—responsibility of the educational system and the teacher for the results of instruction and the idea that such results are measurable through tests of teacher effectiveness which have been designed by outside agencies.

adaptive—the ability to be adjustable, modifiable, or changing.

affective—the area of human learning which deals with feelings, emotions, values, and attitudes; a "right-brain" (nondominant) hemispheric function.

allocation—The reservation of time, space, resources, or money for specific purposes.

assessment—quantitative or qualitative evaluation of specific characteristics of an individual, a group, a material, or a device.

behavioral objective—a specific, observable statement of exptected learner performance or competency.

career ladder—established vertical path or steps to professional advancement in a specific field.

certification—official professional licensing which authorizes specified professional activity for a specified target population based upon completion of specified requirements or competencies.

change-agent—a person whose acknowledge role is to facilitate innovation within an organization.

channel—in humans, one of the sensory modes of perception and learning, i.e., tactile, visual, oral; in information transmittal, one of several modes, i. e., radio, television, newspaper, etc.

clinical—educational experiences which incorporate the treatment of real problems or real students in real settings.

cognitive—the area of human learning which deals with acquisition of knowledge and information; a "left-brain" (dominant) hemispheric function.

competence—demonstration of a specified level of mastery of an attitude, knowledge, or skill.

component—a specified element or ingredient.

contingency contracting—an agreed upon plan between pupil and teacher for achieving agreed upon goal(s) which utilizes consistent reward and reinforcement of desired pupil behavior.

contingency management—advanced preparation of programs, plans, or alternatives based upon an analysis of the circumstances which may arise in future settings.

continuum—a series of continuing, sequence, and or ongoing events or things.

cost/benefit (cost/effectiveness)—the value received per unit of cost in terms of product, time, or resources.

criterion—a measure or standard defined as critical. Plural: criteria.

critical path—a network analysis approach in which activities are analyzed or designed to allow no wasted nor "free" time during their completion.

cycle—an interval of time during which a series or succession of events is completed.

design—a plan which translates theory into practice through deliberate incorporation of specific elements and structures for a specific purpose.

development function— activities which have as their purpose problem-analysis and the origination and implementation of the resources that will solve the problem(s).

device—a learning resource traditionally defined as "hardware," i.e., the camera in comparison to the film (which is "software").

differentiation—organizational staff structure in which there are specified role descriptions for different tasks based upon different sets of required competencies and skills.

differentiation of training—refers to individualization and/or personalization of instruction.

enabling— allowing student to proceed from present point of achievement to a specified future point of achievement through specification of objectives, experiences, and/or settings.

entry point—a place in a program or a system which allows new data or new target population to begin or be entered.

events (of instruction)—all the external components ar activities within a learning experience, such as objectives, motivation, faciliation of performance, assessment of performence, etc.

exit point—place or point in a program or system which provides summation, completion, or termination.

formative evaluation—provides data for remedation, revision, or next-step decision-making.

generalist—a person who has more than one area of expertise or knowledge.

hierarchy—an arrangement of related elements which shows the subordinate and superordinate relationships.

individualization—differentiation of instruction according to individual pupil needs and differences.

IMS—Instructional Management System, a specific computer-assisted instructional management system developed by System Development Corporation and Southwest Regional Laboratory for Education Research and Development Corporation.

IPI—Individually Prescribed Instruction, a specific program of individualized instruction which began at the University of Pittsburgh's Learning Research and Development Center.

instructional setting—total environment in which instruction is conducted; unique to each set of pupils, each given pupil, and for different pupil outcomes (same as learning environment).

instructional staff—in teacher training programs, those faculty members who are directly responsible for instruction involving trainees; may be college or public school faculty. This staff is distinct from management stadf and support staff.

instructional tasks—describable units of teaching behavior.

interdependent—mutually dependent.

interdisciplinary—involving interdependent relationships among professionals or subject matter from different fields of study.

interpersonal—relations between two or more persons.

intrapersonal—referring to one's inner life of mental and emotional well-being.

intrinsic—the essential nature of a thing or being.

management/information system—a program or method which records and processes information and provides feedback from this to managers for use in decision making.

media—all forms and channels used in the process of information transmittal.

microteaching—a specific instructional technology using a small (4 to 5 pupils) group, short ( 5 to 7 minutes) time, one skill- or one-concept lesson, observed and analyzed for one teaching skill, and videotaped for immediate feedback for the purpose of evaluation and reteach of the lesson based upon feedback. Rationale—small size, time, objective allows for maximum teacher control of the situation.

minimax—a process which utilizes minimum effort to gain maximum results.

model—a conceptualization in the form of an equation, device, narrative, or graphic display which represents an existing or theoretical real-life situation (also a paradigm).

module—an organized self-contained collection of learning materials assembled to achieve a specific objective(s); may last from several hours to several weeks of instruction.

multimedia—the complementary integration of more than one medium for instructional purposes; in pulbishing, all media other than print.

multiple path approach—instruction is designed to allow students to pursue alternate activities in terms of previous successes, failures, or personal choices.

needs assessment—collection of data to identify an individual's or group's problem(s), present values, future desires, descrepancy between reality and future desires; places priorities on the problems and descrepancies identified.

network—system of interconnected points, agencies, organizations, or ideas.

nonverbal communication—transfer of meaning through modes other than language or speech.

on-the-job—any activity performed under working conditions.

open classroom—instructional setting which incorporates principles of learner autonomy, initiative, participation in goal setting, and selection of instructional materials; provides active involvement in learning; may or may not be an open-space classroom in which there are few or none of traditional facility walls and doors.

open system—a system which is adaptive, affected by outside factors, and self-renewing.

paraprofessional—a teacher's helper, usually with less professional training and fewer competencies than the teacher (also teacher aide).

peer—member of same generic group, i.e., teachers/teachers; pupils/pupils.

peer evaluation—assessment of performance or competency by member of one's own generic group.

PERT—Program Evaluation Review Technique, a specific type of network for evaluating activities based upon time.

personalized instruction—learning experiences designed to meet individual needs of the learner in terms of rate, level, values, and choices; usually occurs in individualized or small-group situations, but may also occur in larger groups if it meets the above criteria.

PPBS—Planning-Programming-Budgeting System, an integrative process of comprehensive curriculum development in which alternate experiences are developed for identified objectives.

programmed instruction—independent engineered learning unit which is designed: 1) in an ordered series of specific hierarchical steps which

are ordered from the simplest to the most complex; 2) to provide immediate pupil feedback; 3) to often provide alternate routes for immediate remediation; 4) to enable student mastery of content upon completion.

remediation--corrective instruction.

research and development--an exploratory or problem-solving activity in which the purpose is a finsihed product that can be used in instructional settings.

self-pacing--instructional organization which has no specific time limit for completion.

simulation--instruction in which the teaching-learning environment is restructured and controlled for training purposes. It may be artificial, i.e., paper/pencil, mulitmedia, or it may be a smaller piece of reality. It always requires active pupil involvement in real-life conditions.

specialist--one whose expertise is highly developed in one particular field or subject.

summative evaluation--comprehensive terminal assessment at a designated point in an instructional program for the purpose of validating the learner or the program.

synthesis--the combination or production of parts, elements, or components to form an integrated whole.

system--an interactive set of orderly and persisting inter-relationships among parts of a whole, may be open, subject to outside influences and self-renewing; may be closed, not open to outside influences, and therefore self-disorganizing or self-dissolving.

systems analysis--the discovery, identivication, and ordering of components and sources of variability within a system; includes measurement of error and arrangement of elements to improve system performance; includes application of the above process to problem-solving and design applications of an original nature.

technostructure-an organizational pattern in which roles are usually differentiated which is based upon technological systems and their application to instructional and decision-making activities.

terminal behaviors-competencies which are the desired end-product of a unit of instruction or of a program of instruction.

variable--a factor having two or more mutually exclusive properties or values.

videotape--a recording tape on which both sound and visual signals are recorded for television use.

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